

Newsletter

No.133 December 2007

Price: \$5.00

**AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED
Council**

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Public Officer

Kirsten Cowley
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Hansjörg Eichler Research Committee

Barbara Briggs
Rod Henderson
Betsy Jackes
Tom May
Chris Quinn
Chair: Darren Crayn, Vice President (ex officio)
Grant applications close: 14th Mar/Sep annually

Affiliate Society

Papua New Guinea Botanical Society

ASBS Web site

www.anbg.gov.au/asbs

Webmaster: Murray Fagg
Centre for Plant Biodiversity Research
Australian National Herbarium
Email: Murray.Fagg@environment.gov.au

- Book flyer: Gwen Harden's Tropical climbers
 - ASBS Membership application and ASBS 2008 Membership Fees (refer also envelope with this issue)
 - ASBS 2008 National Conference flyer

Publication dates of previous issue
Austral.Syst.Bot.Soc.Nsltr 131-132 (June-September 2007 issue)

Hardcopy: 18 Sep 2007; ASBS Web site: 11 Oct 2007

From the President

By the time this Newsletter arrives 2007 will be behind us and we will be embracing the new year. I hope you and your families have all got safely through the festive season. On behalf of Council I would like to wish you all the very best for the year ahead.

Nancy Burbidge Medallist for 2008

ASBS Council is pleased to announce that the 2008 Nancy Burbidge Medalist will be Professor Stephen Hopper. Stephen, the former Director of Kings Park and Botanic Garden in Perth from 1992 to 2004 and Foundation Professor of Plant Conservation Biology at the University of Western Australia from 2004 to 2006, currently holds the position of Director of the Royal Botanic Gardens, Kew. He is a past president of ASBS so should be well known to members. The medal will be presented at the annual ASBS conference which will be held in Adelaide later this year. Congratulations Steve.

The new Pauline Ladiges Prize

Council is also pleased to announce that, beginning in Adelaide, ASBS will be offering a prize for the best spoken paper delivered by a student member

of the Society at its annual conference. The award will be known as the ASBS Pauline Ladiges Prize. In naming the award Council is recognising the wonderful support and encouragement that Pauline has provided to scores of students over many years. I cannot recall an ASBS conference where post-graduates students from the School of Botany at Melbourne University have failed to turn up in numbers and play an active role in the conference. The award will be judged by the two non executive members of the ASBS Council together with the Chair of the conference organising committee or her or his nominee.

I would also like to convey the Society's congratulations to Professor David Mabberley who was recently appointed Keeper of the Herbarium Library, Art and Archives at the Royal Botanic Gardens Kew. David was the recipient of the ASBS Nancy Burbidge Medal in 2003. He will take up duties at Kew in March this year.

I am looking forward to the year ahead. It will be my last as president of ASBS and there still are a few things I would like to see completed before October.

John Clarkson

ASBS Inc. business

2007 Annual General Meeting of the Australian Systematic Botany Society, Inc.

5:00 pm, Monday 24th September, at Cazaly's, Palmerston, Darwin, Northern Territory

Starting time: 5:20 pm. The President welcomed the 30 members present.

Present: John Clarkson (President), Darren Crayn (Vice President), Anna Monro (Treasurer), Kirsten Cowley (Secretary, Public Officer), Marco Duretto (Councillor), Dale Dixon (Councillor) and 30 members.

Apologies: Ian Cowie

1. Minutes of the 2006 Annual General Meeting

Proposed that the minutes of the 28th Annual General Meeting (as published in *The Australian Systematic Botany Society Newsletter* Number 126) be accepted.

Proposed: Annette Wilson; seconded: Brendan Lepschi. Carried.

2. Business arising from minutes

Nil.

3. Presidents report

Presented by John Clarkson. **Proposed: Judy West; seconded: Rosemary Purdie. Carried.** See Attachment 1.

4. Treasurers report

Presented by Anna Monro, who reminded the meeting that it was for the period 1/1/06 to 30/6/07. She pointed out a few things: the slight increase in full paying membership following conferences; the general higher income and lower expenditure and for the Eichler Research Fund, a lower income and a higher expenditure. Summarising, she noted that the finances are in a healthy position and that there might be potential for greater investment earnings. Anna also wanted the meeting to note that succession for the position of Treasurer needed to be thought about.

Proposed: Anna Monro; seconded: Wayne Gerbert. Carried. See Attachment 2.

5. Newsletter and web page report

The latest Newsletter (June – September) was a combined issue due to the lower number of contributions. Robyn and Bill Barker thanked the members of their continued support. They also thanked Murray for his great web work. Succession for the role of editor was also brought to the attention of the meeting with Bill indicating that he would only be available for another year. Robyn indicated that she could stay on with Jenny Barker taking on Bill's role but any other members who might be considering taking on the role are encouraged to do so.

John Conran raised the issue about providing a pdf. This is already being done and some overseas institutions take advantage of this option.

Murray Fagg presented the Web page report. It was noted that the numbers go directly to ASBS and not through parent organisations. Anna asked about what people searched on but Murray can't tell. John Clarkson thanked Murray for his continued work for ASBS.

6. Eichler Research Fund

Darren Crayn presented a summary of Eichler Research Fund activities. 10 applications were received in March this year, while the September round received 5 applications. These were currently with the Committee. The results will be known by the end of October. We will be going with electronic submission if the applicants have access to this technology from now on.

Succession for this Committee was mentioned as the current members have been on it since 2003. Once formal agreement between us and New Zealand counterparts is reached then the possibility of a NZ rep is likely. The application process could then also be made available to New Zealand as well.

Since the Eichler Research Fund is financially performing very well, there was much discussion from the floor about other ways students can be supported.

Vote of special thanks to the Eichler Research Fund Committee (Barbara Briggs, Rod Henderson,

Betsy Jackes, Tom May and Chris Quinn) for their efforts. **Proposed: John Clarkson; seconded: Brendan Lepschi. Carried.**

7. Any other business

IBC

Judy told the meeting that the next IBC will be held in Melbourne in 2011 at the Melbourne Convention and Exhibition Centre. A Secretary-General meeting needs to be found to coordinate this large meeting. This is a 2 year full-time position. If any members have any ideas for symposia, Judy would be happy to receive emails. She emphasised that it will comprise more than systematics. Tim Entwistle is the chair of the Scientific Committee which should be made up of 10-12 botanists. There will be fieldtrips nominated for each state and CHAH will be approaching each herbaria to come up with ideas. She envisages ASBS to be heavily involved.

Judy is the President, with Pauline Ladiges and Jeremy Burdon (Chief of CSIRO Plant Industry) Vice Presidents. CSIRO PI is the host institution. The ASBS Newsletter will be used to keep people informed. There is also a website.

There was some discussion from the floor on ways that ASBS could participate in the IBC.

8. Election Results

Returning Officer (Kirsten Cowley) indicated that the number of nominations received was the same as the number of vacancies. The following members elected (unopposed) to the positions indicated and took office from the close of the AGM.

President:	John Clarkson
Vice President:	Darren Crayn
Secretary:	Kirsten Cowley
Treasurer:	Anna Monro
Councillor:	Marco Duretto
Councillor:	Dale Dixon

Meeting closed: 6:30 pm

Attachment 1 – President's report

Welcome to the 29th Annual General Meeting of the Australian Systematic Botany Society. While this meeting is annual in the sense that it is the first meeting for 2007, it has actually been 18 months since the last AGM was held in Canberra in March 2006. This has been brought about by the changes to the rules of the Society which altered our annual reporting dates. Anna Monro will discuss this further when presenting her financial report. It is important to keep this in mind for the figures Anna will present this year are for an 18 month period rather than the usual twelve.

Councillors are keen to strengthen the links with other botanical societies in the Australasian area. We have been exploring options for a large part of this year. This differs from the debate we had a few years ago when the notion of broadening the aims of the Society to encompass zoological systematics was canvassed. The Society for Australian Systematic Biologists (SASB) had its origins in this debate and many members of ASBS are also members of SASB. The two societies have even held a couple of very successful joint conferences. This time, the aim is to maintain a clear botanical focus. The botanical systematics

community in Australia is not large and ASBS has probably reached its maximum size. This is probably true for other botanical societies in our geographical area. While membership numbers per se are no measure of the vitality of a society, Council feels that there are many benefits to be had by broadening our outlook.

With this conference following on from the CHAH meeting last week we are fortunate in having Ilse Breitwieser and Patrick Brownsey from New Zealand here in Darwin. Councillors met with them earlier today and their response was very positive. We will be pursuing this further over the next few months. What has been suggested initially is a formal affiliation with either the New Zealand Botanical Society or the New Zealand Plant Radiation Network, or perhaps both. The outcome in the long term might well be the broadening of the Australian Systematic Botany Society to become the Australasian Systematic Botany Society but this is something Council would not consider doing without first consulting widely with members. If this does happen, and I personally would support such a move, it will probably happen after I have left Council but I am happy to have been able to play a part in the genesis of the idea.

Another group Council has been speaking to is the Palynological and Palaeobotanical Association of Australia. This small association had about 60 members in 1996 but, we are led to believe, has not been active for many years. The notion of amalgamation or incorporation with ASBS has been raised twice before, once in 1999 when Tim Entwisle was president and again in 2003 when Steve Hopper was in the chair. Nothing was resolved either time but the issue has been brought to Council's attention once again. Council would be happy to proceed with the merger. We think it would benefit both groups. We have indicated our support for the idea but the final decision rests with PPAA.

In my report to the last AGM, I spoke about the Nancy Burbidge Medal and Life Membership, two ways the Society has of recognising service to Australian botany, albeit it in quite different ways. There seems to be some confusion about the Nancy Burbidge Lecture and the presentation of the Nancy Burbidge Medal. The first Burbidge Lecture was delivered by Selwyn Everist in Sydney in January 1979. Since then the lecture has been delivered 13 times, usually, but not exclusively, by a prominent Australian botanist. The Nancy Burbidge Medal was not struck until 2001. Judy West was the first recipient. Since then medals have been awarded to Bob Hill (2003) David Mabberley (2003) and Barbara Briggs (2005). Only Judy and Bob presented a Nancy Burbidge Lecture. While Council would like to see the Burbidge Medal presented at an

ASBS sponsored conference, and for this to be followed by an address by the recipient, we realise this may not always be possible. This will not preclude the awarding of the medal. Council will find some appropriate time and place to make the presentation. In some years someone may be invited to deliver the Burbidge Lecture who may not be presented with a medal. This is no slight on the speaker. It simply reflects the very high standards Council sets for medal recipients. We are keen to ensure it remains an award of great significance and is recognised as such by the botanical community. The criteria for the award and the process whereby people can be nominated were published in the Newsletter some time ago. We plan to include this information on the Society's web site soon.

I am sure you are all enjoying this conference. Dale Dixon has done a wonderful job and has once again shown that a successful conference can be held away from the major southern capitals. Thank you all for your support. I appreciate how expensive it can be to get to places like Darwin. Council feels it is important that we have plans for conferences which take us simply beyond the following year. It helps members plan ahead and helps organising committees link with other societies. We have firm offers of support which will take us out to 2011. Next year's conference will be held in Adelaide from 29th of September to the 3rd of October. Bill Barker will be discussing this briefly tomorrow afternoon. This will be followed by Armidale in 2008. Then, as part of Council's desire to strengthening trans Tasman links, we hope to jointly host a conference with a New Zealand botanical society in New Zealand in 2010. This brings us to 2011, a very important year for Australian botany, for, as you know, that year Australian will host the XVIII International Botanical Congress in Melbourne. We will hold our Annual General Meeting in Melbourne to coincide with the IBC but I think it would be good for the Society if we could be aligned with the conference by sponsoring one or more systematics sessions or some social function for visiting systematists. We will be discussing these possibilities with Judy West the president of the organising committee.

With Darren Crayn's help, the New South Wales National Herbarium has offered to publish the proceedings of all ASBS conferences in *Telopea*. Papers will be subject to the normal peer review and will, where numbers are sufficient, appear in a special conference issue. Papers from last year's conference in Cairns will appear soon and the plans are to publish proceeding of this conference there as well. This does not mean that conference organisers should feel obliged to take up this standing offer. They may wish to publish the proceedings in some other form. On several occasions the proceedings of ASBS conferences



Fig. 2007–08 Australian Systematic Botany Society Council.

l. to r. Marco Duretto, John Clarkson, Kirsten Cowley, Dale Dixon, Darren Crayn. Inset Anna Monro.

Ph. John Clarkson

have appeared in book form. Council appreciates Darren's help in facilitating this generous offer.

The Hansjörg Eichler Research Fund is something the Society can be very proud of. It is in a sound financial position. We have recently moved from offering one round of grants per year to two and increased the maximum grant from \$1,000 to \$2,000 but Council feels we are in a position to do even more. We spent some time at the Council meeting on Sunday discussing what we could do within the strict guidelines set by the Australian Tax Office. As Chair of the Scientific Committee, Darren Crayn will discuss some of these options later when he presents his annual report on the Research Fund. We would like to hear what you think we might do. I would like to extend my thanks to Darren for the very efficient way in which he handles matters related to the research fund and to the members of the research committee Barabara Briggs, Betsy Jackes, Chris Quinn, Tom May and Rod Henderson.

I think it might be time for a thorough review of the Society web site. This implies no criticism of our web master Murray Fagg who does a wonderful job in responding to requests to put up new material or to make any changes we request. I thank him for his continued interest and support. Over the next few months Councillors will be

looking for ways it can be improved and we would very much like to hear what you think.

I would like to thank Robyn and Bill Barker for their continued efforts in producing the Newsletter. How they manage to maintain the enthusiasm to produce an interesting and informative newsletter year after year amazes me. Of course there will come a time when they will deserve a break. Bill would like to stand down soon and, while Robyn has indicated that she might continue with the help of her daughter Jenny, there must be a closet editor amongst the membership who just needs an opportunity to demonstrate her or his skills even if it is only to give Robyn and Jenny a hand. Don't be shy.

For an organisation such as ASBS to function efficiently I think it is important to maintain a mix of experienced and new members on Council. In this way the history and culture of the Society can be passed on while fresh, new ideas are introduced. For this reason I think it is important that carefully thought be given to succession so that we guard against the situation where nearly all members of Council reach their maximum terms at the same time. Our rules allow only 6 consecutive terms for any Councillor with a maximum of 3 consecutive years as either President or Vice President. All of the current

Councillors have nominated to continue in their current roles for another year and will be elected unopposed but we need to be looking to the future beyond 2008. I must stand down next year. Darren and Marco will have the option of another term. Anna has served 3 terms as Treasurer and has indicated that she would like a break after one more year. Kirsten and Dale still have 3 or 4 years ahead of them if they so wish. Rather than wait until the AGM is called next year, now is the time

to start thinking about supporting the Society by getting involved with Council. Don't be put off by being based away from the southern capitals. The current Council functions well with members spread right across the country.

In closing I would like to extend my sincere thanks to all my fellow Councillors. They are a great group to work with. You can be assured the Society is in good hands.

John Clarkson

Attachment 2 – Treasurer's report

1. Introduction

It is my pleasure to present the financial statements for the eighteen months ended 30 June 2007. The finances of the Society were run on a calendar year through to the end of 2005, but this was changed to a financial year basis as of June 2006 by special resolution of the membership. At that time we were advised by the ACT Registrar-General that we could submit our next financial report after our 2007 AGM, as we had already held an AGM in 2006. Thus, the figures being presented are for the period from 1 January 2006 to 30 June 2007. Anna Monro served as Treasurer for the entire time.

2. Membership

Membership of ASBS currently hovers at around 310, a very slight increase on the levels of 2005. This is largely due to an increase in the full ordinary member category rather than in numbers of students or of retirees. Thirteen unfinancial members who had not paid their dues since 2004 were written off at the end of 2006 and fifteen other members resigned during the reporting period. Thirty-nine new individual members joined ASBS between 1 January 2006 and 16 September 2007 (Table 1).

Approximately 15% of paying members remain unfinancial, which is around the base level at this point in the year. Two e-mail reminders have been sent to unfinancial members at this point in addition to the reminders on the newsletter envelopes. Members who had not paid their subscription fees by 30 June were removed from the mailing list for newsletters, in accordance with Council's current policy.

The following new members for 2006 and 2007 are welcomed to the Society:

Ms Waipaina Awarau, AQIS Mareeba/James Cook University, Qld.
Miss Melita Baum, School of Botany & Zoology, Australian National University, Canberra, A.C.T.
Prof. David Cantrill, Royal Botanic Gardens Melbourne, Vic.
Mr Richard Carter, School of Botany & Zoology, Australian National University, Canberra, A.C.T.
Ms Bronwyn Collins, Australian National Herbarium, Canberra, A.C.T.
Mr Matthew Donnon, Environmental Biology, University of Adelaide, S.A.
Ms Katherine Downs, National Herbarium of N.S.W., Sydney, N.S.W.
Mr Gavin Duley, University of New England, N.S.W.
Mr Nigel Fechner, Queensland Herbarium, Brisbane, Qld.
Mr Ashley Field, James Cook University, Qld.
Mr Matt Flower, GHD Pty Ltd, Darwin, N.T.
Mr Andrew Ford, CSIRO, Tolga, Qld.
Mr John Gardiner, Grass Patch, W.A.
Miss Martine Goldner, SMEC Australia Pty Ltd, N.S.W.
Mr Daniel Healy, Queensland Herbarium, Brisbane, Qld.
Ms Margaret Heslewood, National Herbarium of N.S.W., Sydney, N.S.W.
Ms Liz James, Royal Botanic Gardens Melbourne, Vic.
Miss Adib Jamiran, School of Botany, University of Melbourne, Vic.
Mrs Helen Jolley, Royal Botanic Gardens Melbourne, Vic.
Bronwen Keighery, Department of Environment & Conservation, W.A.
Miss Amy-Louise Kruger, Carina Heights, Qld.
Dr Kristina Lemson, School of Natural Sciences, Edith Cowan University, W.A.
Ms Emma Lewis, School of Botany, University of Melbourne, Vic.
Mr John Marshall, School of Biological Science, Flinders University, S.A.
Mr Bruce Maslin, Western Australian Herbarium, Perth, W.A.
Dr Cedric May, Cook, A.C.T.
Dr Pina Milne, Royal Botanic Gardens Melbourne, Vic.
Mr Carlos Parra-Orsorio, School of Botany, University of Melbourne, Vic.

Table 1. ASBS Membership as of 16 September 2007 (unfinancial members bracketed)

Fee	Full	Concessional	Gratis	Total
Ordinary	183 (25)	n/a	0	183 (25)
Student	n/a	40 (9)	0	40 (9)
Retiree	n/a	60 (8)	0	60 (8)
Institutional	10 (1)	n/a	15	25 (1)
Life	n/a	n/a	3	3
Total	193 (26)	100 (17)	18	311 (43)

Dr Hervé Sauquet, Royal Botanic Gardens, Sydney, N.S.W.

Dr Tanya Scharaschkin, School of Natural Resource Sciences, Queensland University of Technology, Brisbane, Qld.

Ms Udani Sirisena, Department of Environmental Biology, University of Adelaide, S.A.

Ms Kathy Stephens, Queensland Herbarium, Brisbane, Qld.

Mr Andrew Thornhill, School of Botany & Zoology, Australian National University, Canberra, A.C.T.

Miss Senilolia Tuiwawa, School of Botany & Zoology, Australian National University, Canberra, A.C.T.

Mr Ned Wales, Gold Coast City Council, Qld.

Mr David Warmington, Flecker Botanic Gardens, Edge Hill, Qld.

Mr Alan Watterson, Mullumbimby, N.S.W.

Mr Trevor Wilson, University of Sydney, N.S.W.

Mr Frank Zich, Australian Tropical Herbarium, Atherton, Qld.

3. General Fund

Steve Holmes, of WalterTurnbull in Canberra, audited the 2006/7 books in September 2007. This is the first time that this company has audited the Society's financial statements.

3.1 Income

Income to the General Fund is up on 2005, even taking into account the extended reporting period. For the most part this is due to the profits from the Brisbane conferences being received in 2006, while the expenses for the conference were paid in 2005. There was also an increase in investment earnings over the period and the change to a financial year accounting basis led to a one-off increase in the number of subscriptions received within the period. The General Fund thus finished June 2006 with a surplus of \$14,195 which is a good deal higher than the usual result but is unlikely to be repeated now the shift to financial year reporting is completed.

Subscription fees from members exceeded the level achieved in 2005, despite the relative stability of membership numbers. This is most likely a result of a slight increase in the number of members paying the full subscription rate, coupled with a more systematic approach to contacting those members who are in arrears. Many of these members resubscribe when given a direct email reminder and cutting off newsletters for the remainder has resulted in a slight saving in printing and postage costs.

Book sales were well down on those of 2005, as there were no orders of newsletter back issues to prop up the rather low demand for most of our titles. See the Current Assets section below for details of the publication stock levels as at 30 June 2007.

3.2 Expenditure

Expenditure in 2006/7 did not greatly exceed that in 2005 when the extended reporting period is taken into account. The Society's membership of the Federation of Australian Scientific and Technological Societies (FASTS) ended in February 2006, so no subscription fees were paid in the reporting period. Newsletter printing and postage were again the major expense for the General Fund, although they stayed in line with those of previous years. Six newsletters were printed in 2006/7 with an average cost per issue of around \$1000 (\$1185 in 2005).

The fees and charges associated with the acceptance of credit card payments were up slightly on those of previous years, totalling \$490.30. This can be explained by an increase in the rate charged by the provider of the credit card facility, and by the fact that 55% of all payments received over the 18 months were made via credit card. The ability to accept credit cards has definitely made it easier to accept foreign payments for both subscriptions and books without issues with the exchange rate and overseas cheque costs. The possibility of accepting online payments and American Express credit cards has been investigated but the costs associated with both are considered to be too high. For example, the online payments system has a cost per transaction of around 10% of the current subscription prices and would put an additional burden on the Treasurer to manage the payments. This system is not currently considered feasible, but is something the Society should revisit if a more convenient and cost-effective method can be found.

Other bank fees have been reduced to zero in the 2006/7 period after the elimination of Bank Accounts Debits Tax (BADT) on cheques written by the Society.

3.3 Current Assets in the General Fund

At the end of June 2007 the Society held assets of \$68,270 (\$67,564 in cash, \$706 in books). This represents an increase over the 2005 level.

The books that the Society fully or partially owns, held by Helen Thompson (ASBS sales) and by state chapter conveners, as at 30 June 2007 are as follows:

48 copies of *History of Systematic Botany in Australasia* (partial share)

3 copies of the *Proceedings of the Dampier 2000 conference*

14 copies of *Systematic Status of Large Flowering Plant Genera*

70 copies of *Evolution of the Flora and Fauna of Arid Australia* (partial share)

4. The Hansjörg Eichler Research Fund

The investment growth for the Research Fund has continued to be good, with interest increasing overall assets significantly. A total of \$35,455 was

earned in interest and distributions during 2006/7. However, especially considering the extended reporting period all four investment funds for the research account performed less well than in the previous financial year. It is thus necessary for some of the investments to be re-evaluated and the Treasurer will need to "shop around" for better rates where possible after consultation with a Commonwealth financial advisor.

Eight grants totalling \$13,000 were awarded to students in 2006/7. These were paid directly from the research cheque account. Grantees are asked to present their cheques promptly after receiving them, as payments may otherwise overlap financial years and create complications. Cheques may also not be honoured by the bank after a certain period.

Current assets increased from \$286,036 to \$333,155 in the eighteen months ended 30 June 2007, with most of the Research Fund's surplus coming through members' generous donations. This continued growth enables us to cover the expenses of two rounds of grants and to offer \$2000 as a maximum grant amount. The diversification and performance of the Research Fund enables the Society to continue supporting research in plant systematics by early-career scientists.

5. Taxation

The ASBS continues with its tax-exempt status. Organisers of conferences are reminded that ASBS is not registered as a GST gathering organisation. Planners of large conferences need to obtain an ABN and the relevant status or work through a

registered institution (such as a herbarium). The current conference is being run in this manner. Smaller conferences and workshops can be run through the Society as long as no GST is charged or recovered.

6. Summary

The General Fund retained a healthy surplus in 2006/7, with spending being kept lower than in 2005 when the extended reporting period is taken into account. Income to the General Fund was maintained via investment earnings, profits from the Brisbane conference and by chasing up subscriptions in a more organised fashion. The Hansjörg Eichler Research Fund continues its strong growth and has allowed us sustain earnings while offering larger grants more frequently, which enables us to achieve the primary objective of the Society.

I would like to convey my thanks to the ASBS Council for their helpful input on financial matters over the preceding eighteen months. I've also enjoyed my continued contact with members during this time. However, I have flagged with Council that we need to consider the issue of "Treasury succession", as I've held the position for over three years now and feel it might be time for a change after my next term. If you're keen to take over one of the more challenging but also rewarding roles on Council, I'd be very happy to provide further information.

Anna Monro
Honorary Treasurer
September 2007

AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

COUNCIL MEMBERS' REPORT

Your Council members submit the financial statement of the Australian Systematic Botany Society Incorporated for the period from 1 January 2006 to 30 June 2007.

Council Members

The names of the Council members who held office throughout the reporting period and at the date of this report are:

<i>President</i>	John Clarkson	
<i>Vice President</i>	Darren Crayn	
<i>Secretary</i>	Brendan Lepschi	Term ended March 2006
<i>Secretary</i>	Kirsten Cowley	Appointed March 2006
<i>Treasurer</i>	Anna Monro	
<i>Councillors</i>	Marco Duretto	
	Kirsten Cowley	Term ended March 2006
	Dale Dixon	Appointed March 2006

Public Officer

Kirsten Cowley

Principal Activities

The principal activities of the association during the reporting period were to promote systematic botany in Australia.

Significant Changes

No significant change in the nature of these activities occurred during the reporting period.

Operating Results

The Society changed its financial year end from 31 December to 30 June and consequently the financial results are for the 18 month period ended 30 June 2007.

The operating results are as set out hereunder:

	June 2007	2005
	\$	\$
Research Fund	45,119	43,246
General Fund	14,195	2,202
Total	59,314	45,448

Signed in accordance with a resolution of the members of the Council.

John Clarkson (President)
Anna Monro (Treasurer)

10/09/2007

INCOME STATEMENT

FOR THE 18 MONTHS ENDED 30 JUNE 2007 (audited figures) AND TO 21 SEPT. 2007

RESEARCH FUND

	Note	Sept. 2007	2007	2005
		\$	\$	\$
Income				
Donations to Research Fund		20,000	20,000	20,000
Investment Income	2	n.av. ¹	35,455	26,265
General Fund Transfer		0.00	2,664	982
			58,119	47,247
Expenditure				
Research Grants		0.00 ²	13,000 ³	4,000
Bank Charges		n.av.	-	1
			13,000	4,001
Surplus	3		45,119	43,246

The accompanying notes form part of these financial statements.

¹ Not available. Since accounts for 2007/8 are not complete many figures are unavailable.

² September 2007 round applications have been received, currently under consideration by Research Committee.

³ \$11,000 cleared as of 21 Sept. 2007.

INCOME STATEMENT

FOR THE 18 MONTHS ENDED 30 JUNE 2007 (audited figures) AND TO 21 SEPT. 2007

GENERAL FUND

	Note	Sept. 2007 \$	2007 -\$	2005 \$
Income				
Sales - Books		129	152	549
		129	152	549
Less Cost of Goods Sold				
Opening stock - Books		n.av.	721	784
Closing stock - Books		n.av.	(706)	(721)
Cost of Goods Sold			15	63
Gross Revenue from Trading			137	486
Advertising		0	250	125
Conferences		0	3,803	-
Investment Income	2	n.av.	4,129	1,948
Subscriptions to ASBS Inc.		965	18,036	10,380
Donations to Eichler Fund			2,434	1,222
Sundry Income		74	38	-
Total Income			28,827	14,161
Expenditure				
Transfer of member donations to Eichler		0	2,664	982
Auditors' remuneration		0	1,000	900
Bank fees		0	-	21
Credit card charge facility		57	490	231
Conference expenses		0	3,705	3,551
Newsletter expenses		514.14 ⁴	6,003	4,741
Subscriptions (FASTS)		0	-	1,151
Constitutional change mail outs		0	332	245
Registrar general returns		0	58	28
Miscellaneous expenses (e.g. postage)		0	380	109
Total Expenditure			14,632	11,959
Surplus	3		14,195	2,202

The accompanying notes form part of these financial statements.

⁴ Printing for Newsletter #131.

BALANCE SHEET

As at 30 June 2007 (audited figures) and to 21 Sept. 2007

	Note	Sept. 2007 \$	2007 \$	2005 \$
ASSETS				
Current Assets				
Research Fund				
Cash at Bank		2952 ⁵	953	941
Investments				
Colonial Managed Investment		n.av. ⁶	81,405	68,782
Cash Management Fund		n.av. ^F	98,369	81,635
Australian Bond Fund		n.av. ^F	71,169	69,163
Growth Fund		n.av. ^F	79,259	65,515
			331,155	286,036
General Fund				
Cash at Bank		16,142	14,866	3,812
Investments				
Term Deposit		10,000	10,000	10,000
Cash Management Account		n.av. ^F	42,698	39,542
Inventories - Books		n.av. ^F	706	721
			68,270	54,075
Total Current Assets			399,425	340,111
NET ASSETS				
			399,425	340,111
MEMBERS' FUNDS				
Accumulated surplus - opening	3		340,111	294,663
Surplus for the period	3		59,314	45,448
Total Members' Funds			399,425	340,111

The accompanying notes form part of these financial statements.

⁵ \$2000 cheque to M.Heslewood still to be presented.

⁶ Quarterly statements not yet received for these accounts.

AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS
FOR THE 18 MONTHS ENDED 30 JUNE 2007

Note 1: Statement of Significant Accounting Policies

The financial report is a special purpose financial report prepared in order to satisfy the financial reporting requirements of the members. The Council has determined that the Society is not a reporting entity.

The financial report has been prepared in accordance with the requirements of Australian Accounting Standard AASB 1031: Materiality. No other applicable Accounting Standards, Australian Accounting Interpretations or other authoritative pronouncements of the Australian Accounting Standards Board have been applied.

The financial report has been prepared on a cash basis.

The following specific accounting policies, which are consistent with the previous period unless otherwise stated, have been adopted in the preparation of this financial report.

(a) Membership

Membership is recorded on a cash basis.

(b) Income Tax

Under present legislation the Society is exempt from income tax and accordingly no provision has been made in the accounts.

(c) Comparative Figures

Where required by Accounting Standards comparative figures have been adjusted to conform with the changes in presentation for the current year.

(d) Members Funds

In accordance with the rules of the Society accumulated funds are not available for distribution to its members.

Note 2: Investment Income

	2007	2005
	\$	\$
RESEARCH FUND		
Interest Received		
Cheque Account	12	5
Distributions		
Colonial First State (Diversified Fund)	12,623	9,800
Cash Management Trust	7,070	3,196
Australian Bond and Growth Fund	15,750	13,264
Total Research Investment Income	35,455	26,265
GENERAL FUND		
Interest Received		
Cheque Account	108	61
Term Deposits	865	125
Distributions		
Cash Management Trust	3,156	1,762
Total General Investment Income	4,129	1,948

Note 3: Accumulated Funds

RESEARCH FUND		
Accumulated Surplus – Opening	285,441	242,195
Surplus for the period	45,119	43,246
Accumulated Surplus – Closing	330,560	285,441
GENERAL FUND		
Accumulated Surplus – Opening	54,670	52,468
Surplus for the period	14,195	2,202
Accumulated Surplus – Closing	68,865	54,670
Total Surplus for the period	59,314	45,448
Total Accumulated Surplus	399,425	340,111

Note 4: Research Committee

The Australian Systematic Botany Society is an approved research institute. The approved membership of the Research Committee comprises:

Barbara Briggs	Appointed July 2003
Rod Henderson	Appointed July 2003
Betsy Jackes	Appointed July 2003
Chris Quinn	Appointed July 2003
Tom May	Appointed July 2003

AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

Statement by the Members of the Council

The Council has determined that the Society is not a reporting entity and that this special purpose financial report should be prepared in accordance with the accounting policies outlined in Note 1 to the financial statements.

In the opinion of the Council:

1. The financial report as set out on pages 3 to 8 presents a true and fair view of the Society's financial position as at 30 June 2007 and its performance for the 18 month period ended on that date.
2. At the date of this statement, there are reasonable grounds to believe that the Society will be able to pay its debts as and when they fall due.

This statement is made in accordance with the resolution of the Council and is signed for and on behalf of the Council by:

President: *John Clarkson*
Treasurer: *Anna Monro*

Dated this 10th day of September 2007

**INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF THE AUSTRALIAN
SYSTEMATIC BOTANY SOCIETY INCORPORATED**

Scope

The Financial Report and Council's Responsibility

We have audited the financial report, being a special purpose financial report, comprising the balance sheet, income statement and accompanying notes to the financial statements for the Australian Systematic Botany Society Inc (the Society) for the 18 months ended 30 June 2007. The Society's Council is responsible for the financial report and has determined that the accounting policies used, as described in Note 1 to the financial statements which form part of the financial report, are consistent with the financial reporting requirements of the Society's constitution and are appropriate to meet the needs of the members. We have conducted an independent audit of the financial report in order to express an opinion on it to the members of the Society. No opinion is expressed as to whether the accounting policies used are appropriate to the needs of the members.

The financial report has been prepared for distribution to members for the purpose of fulfilling the Committee's financial reporting requirements under the Society's constitution. We disclaim any assumption of responsibility for any reliance on this report or on the financial report to which it relates to any person other than the members, or for any purpose other than that for which it was prepared.

Audit Approach

Our audit has been conducted in accordance with Australian Auditing Standards. The nature of an audit is influenced by factors such as the use of professional judgment, selective testing, the inherent limitations of internal control, and the availability of persuasive rather than conclusive evidence. Therefore, an audit cannot guarantee that all material misstatements have been detected.

Our procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial report, and the evaluation of significant accounting estimates. These procedures have been undertaken to form an opinion whether, in all material respects, the financial

report is presented fairly in accordance with the accounting policies described in Note 1 to the financial statements. These policies do not require the application of all Accounting Standards and other mandatory professional reporting requirements in Australia.

While we considered the effectiveness of management's internal controls over financial reporting when determining the nature and extent of our procedures, our audit was not designed to provide assurance on internal controls.

The audit opinion expressed in this report has been formed on the above basis.

Qualification

The financial report for the 18 month period ended 30 June 2005 has not been audited by ourselves. Accordingly we are not in a position to and do not express an opinion on the comparative figures for 2005.

Independence

In conducting our audit, we followed applicable independence requirements of Australian professional ethical pronouncements.

Audit Opinion

In our opinion, except for the effects on the financial report of the matter referred to in the qualification paragraph the financial report presents fairly, in accordance with the accounting policies described in Note 1 to the financial statements, the financial position of the Australian Systematic Botany Society Inc as at 30 June 2007 and its financial performance for the period then ended.

Stephen Holmes, Walter Turnbull
Chartered Accountants
Canberra ACT
10th September 2007

New members

Council is pleased to welcome the following new members for 2007 to the Society:

- Dr Murray Henwood, School of Biological Sciences, The University of Sydney, N.S.W.
- Miss Adib Jamiran, School of Botany, University of Melbourne, Vic.
- Dr Michael Moody, School of Plant Biology, University of Western Australia, Crawley, W.A.
- Ms Belinda Pellow, Janet Cosh Herbarium, University of Wollongong, N.S.W.
- Mr Ben Stuckey, Northern Territory Herbarium, Palmerston, N.T.

Hansjörg Eichler Research Fund

Five applications were received in the September 2007 round, which is encouraging following on from last rounds' record of ten applications and suggests there may be a sustainable increase in awareness and interest in the Eichler grants. The standard of applications from students remains high and bodes well for the future.

Three proposals were funded in this round:

- Trevor Wilson (University of Sydney and Botanic Gardens Trust, Sydney), The evolution of bird pollination in the Australian Mintbush (*Prostanthera* – Lamiaceae) — \$1828.
- Helen Jolley (Royal Botanic Gardens Melbourne),

Delimiting the species boundaries within *Crossidium davidai* Catches and *Tortula atrovirens* (Sm.) Lindb. (Musci: Pottiaceae) — \$2000.

- Adib Jamiran (University of Melbourne), Variation and taxonomy of the legume *Paraserianthes*, a relative of the Australian acacias — \$2000.

The closing dates for applications remain March 14 and September 14 each year. As always, the expertise and enthusiasm of the Eichler committee (Barbara Briggs, Rod Henderson, Betsy Jackes, Tom May, Chris Quinn) in reviewing grant proposals is greatly appreciated.

Darren Crayn

Australian Systematic Botany Society Inc.

New round of applications to the Hansjörg Eichler Research Fund

Closing date: 14th March 2008.

See guidelines and form on
www.anbg.gov.au/asbs

Articles

Linné, Solander, the apostles and their time

Sverker Sörlin

History of Science and Technology, Royal Institute of Technology, Stockholm

¹In Swedish history, Linnaeus and his travelling students, “the apostles” have had a place of honour. In the first comprehensive biography of Linnaeus and his apostles, a two volume work, published in 1903, Professor Theodor Magnus Fries referred to them as “these pioneers of nature research” who, despite the fact that some of them “died the deaths of martyrs,” were not discouraged from joining the cause and “tread the same path of starvation...struggle...and death”.

In this way, through Linnaeus and his emissaries, Sweden became a great power in the field of natural history; the monument that each of them raised to himself has undoubtedly proved that it is and shall remain an *aere perennius* [eternal glory].

This statement was of course part of the nationalist rhetoric that has been strong in the history of Linnaeus celebrations, not least for the bicentennial in 1907 and perhaps also this year, although there is now since the 1960's a modern, critical research on Linnaeus that can not be disregarded. Recent historiography on the

travelling students has also noted the problematic aspects and put much more emphasis on the general eighteenth century context of colonial science, commerce, and European expansion.

The journeys made by Linnaeus' students from Uppsala University were unique in as much as they continued for half a century and comprised an unusually large number of travellers for the time. The journeys included voyages to all five known continents and sailing around the fabled Southern Continent - what we now know as the Antarctic.

The journeys were made in cooperation or close collaboration with many other nations. At least five, Denmark, the Netherlands, Russia, Great Britain and Spain, had one or more Linnaeus' students onboard vessels flying their flag, while some students were part of land expeditions. Other nations offered support along the way. These nations were at the centre of empires with far-flung possessions and, in consequence, had a network of trading stations and administrative centres at their disposal, covering the greater part of the world, and an infrastructure capable of supporting such journeys, that the Kingdom of Sweden quite simply did not have.

Linnaeus managed to mobilise a large number of Swedish institutions including Uppsala University, the Royal Society of Sciences at Uppsala, the Royal Academy of Sciences, the House of Nobility, the East India Company, various authorities, the county governors of various provinces and Swedish legations abroad. Linnaeus also used his organisational skills to mobilise and encourage the royal household and the Riksdag of the Estates to support the journeys, although this was possibly even more for the sake of the useful benefits for science in general of which the economic nature of his natural history journeys in the Swedish provinces was a fundamental part.

Linnaeus was one of the world's most celebrated naturalists of the period. His system of assigning species and propagation in nature, commonly referred to as the sexual system, was praised on the one hand and awakened controversy on the other. His journeys were also renowned. His students were ambassadors for his system and were well known in Amsterdam, Berlin, London, Madrid, Paris and other centres of the sciences in Europe. Their reputation as experts reached everyone who

¹ This is the basis of an address that Professor Sörlin gave in Perth in September 2007. Kevin Thiele requested a transcript since he thought it would be of interest to the wider Australian botanical community.

Professor Sörlin has a major involvement with the Linnaean apostles. He is part of the team producing an eight volume work entitled *The Linnaeus Apostles - Global Science & Adventure* in which all the accounts of the apostles' journeys to every continent will be published for the first time in English (Web ref. 1). He has also published a number of articles with Otto Fagerstedt and produced with him the film *Linné - an Ordered Mind* which was being shown at the National Museum of Australia as part of their Linnaean tercentenary celebrations. While in Australia he also gave an address at the National Museum (Web ref. 2) and the transcript of his interview on the naming of plants with Alan Saunders on Radio National's Philosopher's Zone can also be seen on the ABC web site (Web ref. 3).

Professor Sörlin provided an extensive bibliography to supplement his talk. The bibliography was not necessarily complete in detail and we undertook to complete it so that the article could be reproduced for this newsletter. There have been some problems with interpretation since most of the references are to Swedish volumes, but it is hoped that there is sufficient detail for anyone to find the items mentioned.

Web ref. 1. www.ikfoundation.org/shop/linnaeus-gsa.html

Web ref. 2. www.nma.gov.au

Web ref. 3. www.abc.net.au

understood natural history, wherever they lived in the world.

Many questions can be asked in an analysis of these travels. Why was the project undertaken? Did Linnaeus have an original plan and if so when did he develop it? How did he select the travellers he needed? How did he make sure that his travellers did as he wanted or did he quite simply rely on their ingenuity? What 'research environment' did Linnaeus organise in Uppsala that fostered and trained his travellers? And, just as importantly, how, and why, were these distant and costly expeditions financed?

Similar questions could just as well be posed about the apostles' personal views. What drove them? What motivated their willingness to leave the security of home, particularly when the dangers of the expedition were well known? What effect did Linnaeus' personality and his much talked about energy and irrepressible zest have on the apostles? What was attractive in his personality and what offended?

Who is 'apostle' – and how to become one?

Who were these travelling students, or apostles as they are sometimes called? Apart from listing his own successes and merits, as he usually did – for example in his five autobiographies – and often also in correspondence, as in a moving letter to his siblings and brothers in law in 1763, he also made the following statement: "I have arranged for my apostles to be sent to all the corners of the world".

It was more than a fact. It was a grandiose declaration, an integral part of his long list of achievements: books, expeditions and memberships of European academies. Perhaps it is the divine calling he felt that reveals itself, or the incomparable leader's choice of expression. The word "apostle" implies that the travelling students were his messengers, emissaries for a way of thinking, a way of being, somewhat akin to the original biblical apostles.

Linnaeus seldom used the word. When he did it was in connection with his autobiographical texts, for example his notes from 1752 or 1753 where we read that Linnaeus had "his apostles all over the world." In the same passage, Linnaeus assigns students travelling in Sweden to the same category.

Linnaeus had several hundred students. Many of these carried out natural history travels. By no means all of those were referred to by Linnaeus as "apostles". Rather we are talking of some twenty students, some of whom returned to good careers,

or not so good in a few cases, but half of them never returned at all. They were:

- Carl Fredrik Adler, died of fever on the coast of Java at the age of 41;
- Andreas Berlin, died at Guinea at the age of 37;
- Johan Peter Falck, committed suicide as a drug addict in Kazan, Russia, at the age of 31;
- Peter Forsskål, died of malaria in Jerim, Yemen, at the age of 31;
- Fredric Hasselquist, dead of tuberculosis in Smyrna, Asia Minor, at the age of 27;
- Peter Löfving, dead from malaria at a mission station in Venezuela, age 27;
- Olof Torén, died after a trip to East India at 35;
- Christoffer Tärnström, to whom we shall return.

Among the survivors were:

- Carl Peter Thunberg, who travelled to Japan and became Linnaeus' successor on the chair at Uppsala;
- Pehr Kalm, who became a professor at the Academy of Turku in present day Finland;
- Anders Sparrman, perhaps the most eccentric of the travelling students, who played a small role in the history of abolition and human rights: and of course
- Daniel Solander, the parish priest's son from the far north of Sweden who was one of Linnaeus's favourite students and even had an affection for Linnaeus's daughter Lisa Stina – but who went to England and was "lost" to Swedish science but instead became an asset to the whole world, circumnavigating it with Banks and Cook and assuming the unsurpassable position in the history of mankind that is reserved for one who is the first to scientifically describe the kangaroo.

The success of an expedition was completely in the hands of those who participated. The travellers had to be sharp-eyed, have good stamina and, above all, be able to work independently as natural historians. The journeys were also physically demanding, a fact of which Linnaeus was all too well aware, following the hardships he had experienced on his expedition to Lapland, hardships he continually exaggerated.

Voyages to far off continents could take years, and the fact that disease, storms and other dangers were to be expected was never in doubt. It was crucial in every way that the task was given to the right man.

Linnaeus had every opportunity to find his travellers. Students from far and wide attended his classes at Uppsala and he could keep an eye on them during lectures and excursions. But even Linnaeus had to have the skills and characteristics enabling him to spot talent and sort the wheat from the chaff. "A professor," he writes in his

letter to the Royal Academy of Sciences in 1752, primarily distinguishes himself by:

selecto ingeniorum [choice amongst talent], because the right characters or observers are amongst the other hopefuls as comets amongst the stars.

The first apostle to be sent out, Christoffer Tärnström, was exceptional however. He was ordained and appointed chaplain on the East Indiaman *Calmar*. He was 35 and married with two children and hardly ever studied for Linnaeus, although they had been together on field excursions. It was a difficult voyage and the most difficult passage depended on the winds, without the right trade winds the vessel had to wait until the following year - Tärnström was unhappy.

We have little or no hope of catching the trade winds and will have to wait somewhere in the Batavian or Indian islands. It is only unfortunate for my dear wife and children, should something happen to me.

God did not wish Tärnström to return home, and his fate – and the sorrow and despair of the widow, including her demands for a conservation marriage! – taught Linnaeus a hard lesson: never recruit a married man. The people he entrusted to travel had to be well qualified in botany and believe in their master's sexual system of classification. At the same time they needed to be young and single.

When he talked about his students, it was frequently just before they left on some expedition, when sponsors were to be seduced and scientific doubters convinced. The forum normally comprised officials representing the Royal Academy of Sciences, the East India Company, the Court, or potential private donors. Here Linnaeus was in his element, he soon became a master of the rhetoric of conviction, an art he had many opportunities to practise. When Pehr Kalm was to be sent to America, Linnaeus wrote much about Kalm's physical advantages, factors that were considered just as important as the intellectual ones:

... in good health, of humble origins, able to live well on the worst and best of foods so that he may in every way be fostered to withstand whatever he has to endure. His interest in herbs, animals and rocks is so great that he is prepared to run many miles for one single lichen. He is the strongest man I have had in Botany and he is solidly grounded in that — now is the time, later on he will be heavy of foot, lazy and portly and too fat to run like a hunting dog through the forest.

As time passed there were many who heard they were “the strongest” Linnaeus had had “in Botany”. Tärnström had been so labelled, and Hasselquist, Löfving, Forsskål, Solander and Thunberg were also to earn that title.

Finnish Pehr Kalm was born in 1716, but war forced his parents to flee from Finnish Österbotten across the Gulf of Bothnia to Swedish Ångermanland – both provinces were

parts of Sweden's then reduced Baltic empire. He had suggested a number of different travel destinations, including Iceland, but this was of no interest to Linnaeus, as it was far too similar to Lapland. Nor did the Cape and Palestine awaken interest and, initially, his interest in North America was half-hearted. Kalm's fifth choice, China, was so much to Linnaeus' liking that he is reported to have “jumped for joy”. After some research, however, it became apparent that the China journey was not possible and the choice reverted to North America. The purpose of both journeys was, nonetheless, the same. By taking a northerly route, Kalm would be able to bring back plants that withstood the cold climate of Sweden.

An economic enterprise

The expeditions were concentrated on species and classification but at the same time they were primarily, as Lisbet Koerner showed, decidedly economic in nature and aimed at domestic [Swedish] cultivation of useful plants collected with the purpose of reducing expensive imports. This Mercantilist, or Kameralist, idea was the real driving force behind this enormous travel project – and one which made it seem worth the while for private and public sponsors to carry some of the costs. Linnaeus had a number of scientific and personal motives as well but it was economic botany that made the project possible.

Linnaeus acted when he saw an opportunity, when the right student was at hand and the funds available. He did not trouble his mind with solving problems or testing hypotheses in the manner expected of those who followed a “scientific programme”.

Comprehensive instructions to the travellers were more common at the initial stages of the enterprise. They became increasingly rarer and less comprehensive. With hindsight, and experience Linnaeus probably realised that specifying the mission in detail was a pointless exercise; the unpredictable was the order of the day for all of them.

Oral instruction must be assumed in most cases, but one of the early, demanding, instructions, was given in a detailed letter to Tärnström, his first explorer, who had not for a long time been at Uppsala. Linnaeus wrote:

Honourable Sir,

When giving instructions for Mr. Tärnström to observe on his East India journey, the following would be useful.

1. To acquire a tea bush in a pot or at least seeds thereof to be kept according to the verbal instructions he has received from me.
2. Seeds from the Chinese mulberry tree with split leaves...
13. Live goldfish for Her Royal Majesty.
14. Measurements night and day with a thermometer south of the Equator and in Canton.

At the end of the day it was only point 14 that was, to some extent, fulfilled. There were no goldfish or tea bushes, the trophy that Linnaeus continually desired and that each and every traveller to China was urged to bring back - Pehr Osbeck finally succeeded in fulfilling Linnaeus' wish in 1755.

Linnaeus' instructions to the 22 year-old Pehr Löfving, another early explorer who left for Spain where he later joined an expedition to South America, number 27 points, which included quadrupeds, birds, amphibians, fish, insects and vermin as well as trees, herbs, grasses, mosses, soil types, cultivation methods, plant usage and usefulness and their local names. Löfving was also expected to understand and report back on economy, geology, diseases, household medicines, interview Spanish students, send home "a herbarium that included all the herbs in Spain" and "complete a perfect Flora and Fauna Hispaniae."

The most widely used words in the instructions were "everything" and "all things." Löfving was expected to study all plants and herbs, all animals, all types of soil, all types of rock and everything else. And as if that was not enough, Linnaeus urged the young man, who was little more than a boy, to "ask the reasons for everything."

Prior to Kalm's journey, Linnaeus produced a long list of important tasks, the purpose of which was to demonstrate to benefactors how much there was to discover and bring back. One example on which Linnaeus particularly dwelled was the mulberry tree:

...imagine, if one could only find one species of mulberry tree that could withstand our winters how much silk we would not be required to buy from abroad and how many thousands of people could make a living for themselves in this way?

It became an economic shopping list rather than a matter of science. Kalm well understood what was expected of him. He had also made a list of attractive plants that he hoped to bring back to Sweden:

8 different types of oak, mulberry trees, vines, chestnut trees, walnut trees, hemp, a grain named fol Avoine, an infinite number of legumes, medicinal plants, cedar trees, cypresses, sassafras, considerable numbers of roots, maple-trees of which a juice flows in the spring that the Canadians boil for sugar.

In his instructions to Fredric Hasselquist we know that during a botany lecture, Linnaeus pointed out that, curiously and sadly, the Holy Land was just as unknown as the East despite the fact that devout "Catholics" – a negative word in the Lutheran and quite intolerant Sweden – travelled there every year, but they made no efforts to examine animal and plant life. This was particularly regrettable as such knowledge could be useful when interpreting the Bible, a project

that other learned men in Sweden had begun and that Linnaeus felt bound to continue; Hasselquist volunteered.

Another apostle who clearly received instructions from Linnaeus was Daniel Rolander, who travelled to Surinam in South America where he spent a horrifying six months surrounded by jungle beasts and awful insects, and by the hard drinking Dutch upper class the company of which turned him into a de facto alcoholic. The latter's list of instructions had over one hundred points and was typical of Linnaeus in as much as it focused on usefulness.

One of the specimens Rolander was to search for was *Quassia amara*, a plant that could cure typhus fever, a widespread disease that killed hundreds of Swedes every year, including in Uppsala. Rolander succeeded in describing the plant and carried out a great deal of other research in his extremely steamy jungle province, despite the fact that he experienced great discomfort.

Research or collection?

Otherwise, any more detailed instructions in Linnaeus' own hand are lacking. Later apostles, including Sparrman, Thunberg, Berlin and Afzelius, travelled privately and had a far more distant relationship with their former teacher.

Each journey had its own explorative, one might say inventive, method which was exactly the style of research that Linnaeus used and taught during his famous excursions and lectures at Uppsala and on his extensive travels in the Swedish provinces, from his first trip undertaken from 1732, when he travelled to Lapland in the north, through to his fifth and last in 1749, when he went to Skåne in the south.

This was also a recurrent theme of the critics at the time. Linnaeus did not do any research, he just collected, sniffed his adversaries. One can compare this with the rigorous research programmes carried out by other natural history expeditions of the time, for example the French expedition to the Pacific Ocean in the 1780s with Lapérouse, or why not the Danish expedition to Arabia which set out in 1761 with Linnaeus student Peter Forsskål as a member. The expedition was planned in an exemplary manner with detailed reports by a number of Danish and German Orientalists.

In comparison with these projects, the outlines of the expeditions organised by Linnaeus appear less well organised and considerably more vague and tentative. Part of the explanation for this is the fact that Linnaeus had limited resources; first and foremost he had to rely on himself. Institutional support had to be organised separately and in new constellations for every project, and frequently with international participation.

The micro economy of natural history travel

Taught and coached by Linnaeus, the apostles were as good as a multiplier of Linnaeus himself. He drew immediate and direct benefit from their work in as much as he received their consignments and could publish their results in his name; he even counted diaries and notebooks of his deceased students as his own work.

This could be referred to as the symbolic and scientific micro economy of the expeditions, and Linnaeus controlled every aspect of it. When one of his apostles wished to take command of his findings and collection of natural-history specimens, Linnaeus could easily become displeased, as this was not included in the unspoken premise on which the whole project rested.

Most of the research work was unpaid and the apostles received no income from Linnaeus, although in a few cases they received help with their board and lodging. Those who travelled as ship's chaplains, doctors or otherwise were paid for their services but hardly any of the surviving apostles returned to Sweden with money in their pockets.

They may have regarded their natural-history specimens and curiosities as assets, a fact that was sometimes aggravated by the symbolic financial relationship they had with Linnaeus who believed he could lay claim to these assets in his own name.

This fact is well illustrated by the circumstances surrounding Daniel Rolander. On Rolander's return from Surinam in 1756, his relationship with an impatient and intolerant Linnaeus became successively more strained, so much so that Rolander determined to take his seeds to Copenhagen where he also sold his travel account, another asset, to one of Linnaeus' arch-rivals, Professor Christian Gottlieb Kratzenstein, and his herbarium to the botanist Christian Friis Rottböll.

If it was not the Catholics, it was the Danes...

Others returning with their "capital" in the form of herbs and precious travel journals were Anders Sparman and Carl Peter Thunberg: their return was, however, so delayed that Linnaeus was unable to gain any benefit from their material. Indeed, when Thunberg eventually arrived at Uppsala Linnaeus was already dead. In earlier cases Linnaeus had taken charge of incoming material, unless the natural-history specimens went to foreign principals, as was the case with Forsskål and Löfning as well as Johan Peter Falck who was in the pay of the Russian Empress.

The way the voyages were arranged, however, generally resulted in the major costs never being settled. It would simply have been impossible. For the expeditions to be realised, it was almost a precondition that the infrastructure was provided by others, either the East India Company or a foreign expedition. Amongst the few exceptions to this rule were a few apostles who travelled overland on individual expeditions.

Pehr Kalm travelled through New England and Quebec on funds he had acquired from various sources, but as he wrote on his departure, above all, "my gracious and peerless Mr Judge of Appeal of the Åbo Circuit Court of Appeal, Baron Sten Carl Bielke...". Kalm also used a different infrastructure, including colleagues, public officials, clergymen and natural historians on whom he called and with whom he could stay occasionally; these included John Bartram in Philadelphia and a future celebrity such as Benjamin Franklin.

Fredric Hasselquist also travelled across country and alone to Asia Minor where he died on the west coast of Turkey, in Smyrna (now known as Izmir) in February 1752. At that point Hasselquist had no money left and Linnaeus experienced this as a severe personal loss – not only had he lost a student but he was also concerned that the material collected would not be sent to him in Sweden. He managed to settle the issue with funds from the Queen.

Institution, networks, career

How are we to perceive this grand scheme of expeditions? At the outset, I posed a number of questions that in various ways relate to what, in today's terms, we would call the research environment Linnaeus created at Uppsala. His energy – scientific, economic and patriotic – have all been mentioned; but how are we to view the scientific environment, or "institution"?

In one important aspect, this environment was a conscious creation, designed in harmony with the principles in which Linnaeus believed. Initially it rested on a combination of the characteristics of Linnaeus and his closest associates at Uppsala where he indisputably was a central figure at the university – he was made vice-chancellor on two occasions, and as time passed he became the university's most celebrated professor.

He worked methodically. Bright and capable students were drawn to him and he took pains to see that he won their loyalty. In this work he mobilised considerable charm and powers of persuasion. The greatest attraction was nevertheless his reputation, both as teacher and researcher.

Linnaeus also took great pains to make sure that his work linked to international research, with

which he both competed and collaborated. His visit to Holland in his early years might not have been planned in that light, but its most lasting effect was that it formed the basis on which he proceeded to build up an international network of contacts and peers. This was to prove invaluable for carrying out projects and sending his apostles to the far corners of the planet where they could gather material that he would otherwise have been unable to obtain.

In all this there is a certain existential, or even psychological aspect that, with time, Linnaeus was forced to admit affected him in the form of depression and soul-searching. The not insignificant loss of human life presented a problem for his large-scale methodology, and that it seriously shook Linnaeus' understanding of the world as a deeply teleological and moral divine order is well documented. He really did mourn the loss of his students, some of whom he was extremely fond of, particularly Löfving. He must have felt at least some self-reproach and pondered privately on his responsibilities, although in public he did not admit any mistakes, nor was he accused of wasting innocent lives. That kind of accountability did not exist.

The global division of work was, in its orchestration, also an important explanation of how it was possible to make his students travel; they realised, or were prevailed upon to see, that this was the route science had to take in order to assert itself. Linnaeus' own success was closely tied to the successes of his students, they were interdependent. On a moral level, such thoughts must have helped Linnaeus to legitimise his actions and perhaps even softened his self-reproach, something that would otherwise have been more difficult. His own rhetoric argued that such a scientific programme, and thereby the sacrifices made, were undertaken for the benefit of Sweden's economic advance and gave additional legitimacy.

Nevertheless, it is clear that this alone was not sufficient for Linnaeus' disciples despite the fact that those who were close to him were brought up to believe in the purpose and benefits of the project. Letters and notes written by the apostles clearly express the doubts they felt although the degree of influence was plainly dependent on their closeness to Linnaeus and, to some degree, on the development of their own careers.

Linnaeus' flattery and persuasive powers, which he used with his students as well as his sponsors, always played a role. This is one of the most conspicuous sides of Linnaeus' scientific and organisational management skills. He knew how to seduce and encourage young researchers to strive and gain good qualifications for a career in Sweden or abroad. He knew how to play the field

and, in many ways, through correspondence or personal meetings, he personally knew his peers all over the world – at least during those years when he was at the zenith of his powers. In this way he controlled the careers of others, even if, as a matter of course, his adversaries could be used for unholy alliances.

How willing were the apostles?

The willingness among the travelling students to participate in expeditions varied. Concern was mixed with eagerness, but the overall pattern is that those who were dependent on qualifications and who had no paid office or apparent opportunity of employment were the ones Linnaeus was able to persuade to travel. In general it is these same students who were closest to him.

Conventional heroist historiography has made a special point of the good and national character of the students. They were basically loyal apostles who, at the end of the day, found themselves able to make the greatest sacrifice for their master, king and country.

Or so it has been said – with one major exception, Daniel Solander, who deserted his mentor, stayed illoyally in England, made service for Banks and the British and never returned home to take up the chair at Uppsala that Linnaeus had secured for him – nor for that matter to take up the chair in St Petersburg that Linnaeus had also aimed for him, as a wise career step. Linnaeus was even prepared to accept Solander's relationship with his daughter Lisa Stina. "The ungrateful Solander", as Linnaeus called him, and as he has to a large extent gone down in nationalist historiography in Sweden – indeed it is only in Australia that a proper biography has been written, by Edward Duyker and published in 1998.

This image of the apostles as loyal disciples ultimately comes from Linnaeus himself. It pays little attention to the outcome in individual cases. The course of events was considerably less controlled and predictable. In fact it is clear that the apostles had more doubts than Linnaeus would admit, and perhaps more than he knew. Johan Peter Falck, for example, who was sent to St Petersburg, proved himself capable of great independence in his judgement of his teacher when the latter could not read his comments. When he was made responsible for the gardens in St Petersburg in 1765 and appointed Professor of Medicine and Botany, his eight-year younger brother Anders who was studying at Uppsala at the time wrote:

How could I not be pleased to see the old man change colour? Now you can tell him to kiss your arse without thereby risking a farthing.

Between themselves, the brothers described Linnaeus as "the old man" or "the old man at

Svartbäcken", the area of Uppsala where Linnaeus lived, and commented that they did not mind him turning green in the face; this was in remarkable contrast to the humble words that Falck used when addressing himself directly to Linnaeus.

Other examples can be found in correspondence between the apostles themselves. Prior to his expedition to Spain and America, Löfving wrote to his trusted friend Pehr Bierchén that he had, in point of fact, had little choice in the matter. His exceptionally close relationship with Linnaeus had, in practice, been the determining factor when deciding to go. Linnaeus also had considerable problems with his apostles when they were out in the field. Linnaeus pushed Kalm who then complained when he was asked to go further north in Québec. In the end, however, Kalm hesitated and did not go. Linnaeus was furious.

'The ungrateful Solander'

Linnaeus was often furious. Or simply sad, unable to understand why. He was the greatest genius that the country possessed and hailed everywhere – even at the Royal court where he served restlessly as keeper of the Queen's collections and sometimes as her *amusement privé*. She liked him and his wit and his learning, which she understood, being the sister of King Frederic of Prussia and corresponding with Voltaire.

But maybe the most lasting anger and disappointment was the one that Linnaeus felt towards Solander, this deceitful, disloyal student, sleeping with the enemy, or at least with the competitors in London. Linnaeus wrote hosts of letters, but for six years Solander never answered.

Perhaps it was not very strange at all. When Solander arrived in London he quickly discovered that there was a market for his skills. He had served as Linnaeus's assistant in making tiresome catalogues of the natural history collections of minor Swedish noblemen. Here he was in London, in the summer of 1760, thrown into the honey-pot of a global empire of collections, and soon best buddy, if not more, with Joseph Banks, a likeable, generous and likeminded friend and brother in arms of natural history, and seduced by a swirl of parties and public breakfasts and thrilling sensations of upper circle intellectual conviviality.

Solander loved it, and he could compare it with Uppsala which he knew, a town of two thousand anxious souls compared to bustling million and a half in London. He could also figure out what it would be like to sit in St Petersburg, "educating Russian bears", as Peter Collinson wrote in a letter trying to make sure that he could stay in England and make a career there, which he did, not just

with Banks but also in the British Museum, where he was the ideal curator.

It was not really as a loyal Linnaean that Solander performed his work on board the Endeavour. On the contrary, it was as a young man who had been locked into the confines of a closet of rigid Lutheranism and paternalist professorialism – and who was finally free.

Banks had a quite different style than Linnaeus as Principal Investigator. It was should we say more aristocratic. He allowed the travelling naturalist full rights to everything. He sought nothing for his own scientific career because he did not really wish to have any. He already had everything, so good company was what counted, and responsibility for empire, which he built systematically.

Their travels were of course not innocent. Sexual assault of South Seas women was common among Cook's men, although Cook himself found it less pleasant. And repeatedly they entered into shooting incidents with local populations with several casualties; Solander is known to have opened fire on two occasions and might possibly have killed a Maori on the northern tip of the North Island.

After Solander's premature death from a stroke in 1782, Banks was devastated by the loss. His words of remembrance of his old friend are worth quoting, as evidence of what a life in creative freedom and mutual sympathy can mean for fulfilment:

During the voyage [with Cook], that lasted for three years, I can say about him, that he combined a rare laboriousness with an ingenuity that penetrated everything, and a remarkably steady temper. During all this time we did not have one single harsh exchange of words. We competed in finding the best possible argument on all subjects, but we always ended where we have started, in good spirits, after one of us had accepted the reasoning of the other.

This seems quite humane, does it not? Even enlightened. In a sense this is what it was all about – Solander met Enlightenment in London and in travelling the world, and to Enlightenment Linnaeus did not belong, despite living in its very century, spanning it, just like a Voltaire, a Rousseau, or a Montesquieu.

The globalization, of sorts, that he advocated was not principally one of liberty, tolerance and equality of races, but the one that is today represented by the World Forum of Davos, or the pharmaceutical industry, roaming the tropical rain forests for genetic substances, or building national innovation systems with universities as corner stones. Linnaeus might have held a medieval mind and believed in superstition, and he was clearly not an Enlightenment philosopher. Yet his

natural history travel enterprise put Sweden on a modernizing path, linking science and economy.

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Taking botanical photographs

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¹With the proliferation of digital cameras and the ability to store huge amounts of data, herbaria are starting to store photographs as well as dried specimens of plants. With such a large range of available equipment and lots of hype and glossy advertisements it is very difficult to decide what equipment is best to use.

Equipment required for taking the images

An SLR camera is essential

Compact or 'Point and Shoot' cameras are of very limited use and cannot take quality close-up images. This is because these cameras are essentially video cameras that can take snapshots. The output from the sensor is continuous and the picture you take is rather like a screen shot from your computer. This means you cannot have an optical viewfinder and the electronic (LCD) screens are not of sufficient resolution to determine if the subject is in sharp focus or not. Because the output is continuous there is no automatic aperture so even if the camera has manual focus the lenses do not have f stops higher than f8. Even f8 is too dark on these cameras and you can barely see the subject on the screen.

The SLR camera

Single Lens Reflex (SLR) cameras have a sensor that works on momentary exposure (like film) so the sensor simply replaces the film and the basic camera functions remain the same as for film cameras.

The traditional way to take close images is with a Macro (sometimes called Micro by Nikon) lens. Macro lenses are (or I should say were) made to have a greater depth of field, and they focus in more closely than normal lenses. Modern Macro lenses that I have tested fall well short of what was once expected of these lenses. With the Nikon and Sigma lenses the resolution tapers off past f25 and the Canon lens drops away after only f16. If you have a Nikon Digital SLR you can look for one of the older Macro lenses on eBay. The best one is the *AF Micro Nikkor 105 mm f2.8 D*. The D extension indicates that it was made in 1993 or later and refers to 3D flash information - nothing to do with digital. This lens sells for about \$500, having retained its value because it is arguably the best Macro lens ever made.

Lenses for close-ups

The ideal setup is a high quality digital SLR camera with a 100–105 mm macro lens for close-ups and an 18–200 mm zoom lens for general shots. The in-built pop-up flash that most of these cameras have produces very good results with the macro lens. The use of a flash enables very small apertures to be used, maintaining the maximum depth of field. I use a ring flash which produces clear bright images without shadows. The aim is not to produce artistic images, but to show as much detail as possible of the specimens.

There is, however, an alternative to a Macro lens. The 'Big Three', Nikon, Canon and Pentax, usually offer a basic 'kit' lens with the body which is a 18–55 mm zoom lens. These are very basic lenses but produce very sharp images with little distortion. It is well worth taking this kit lens (with Pentax it is the same price with or without the lens!) as with the addition of a small clip-on close-up attachment, very high quality macro photographs can be taken.

Close-up lenses come in two types; one or multi element units. The three element ones such as the *Raynox DCR-250* are by far the best as they offer the highest resolution and least distortion. An extremely efficient one made by the Japanese company Raynox is called the *Raynox DCR-250 Super Macro Close Up Lens* (Fig. 1).²

When used with a 18–55 mm lens outstanding results can be achieved. The images are very sharp and the depth of field is up to three times that achievable with a Macro lens. When photographing complex inflorescences made up of very small flowers, the whole lot can be in focus. Even though the lens does not produce

Fig. 1. Raynox DCR-250 Super Macro close up lens, with a universal snap-on adapter fitting 52–67 mm threads.



¹ An article developed from a poster presentation at the 2007 ASBS National Conference, Darwin. This article will be presented in pdf form with colour images on the ASBS Web site www.anbg.gov.au/asbs.

² In Australia this can be purchased from Greg Smith's Dvdreamtime Photo and Video (Web ref. 1) for \$119.00. Follow this link for a small article and sample images (Web ref. 2). I purchased my lens from BugEye Digital (Web ref. 3) for only \$US39.95 but at the time of writing they do not have them in stock.

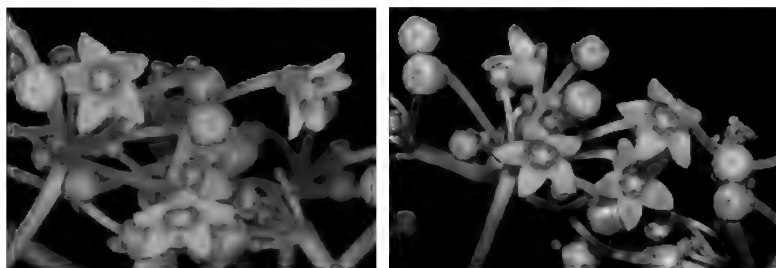


Fig. 2. Comparison of New Nikon 105 mm Macro Lens on D200 (left) and Raynox DCR-250 with 18-55 mm Sigma Lens on Pentax K10D (right). Even though the Raynox image has been cropped and enlarged it is still far superior to the one taken with the Macro lens.

1:1 images as the 105 mm Macro lenses do, it is so sharp that the image can be cropped and the resulting picture be made at least equal in size and sharper than one produced with a 105 mm Macro lens. These results can only be obtained with the basic 18–50/55 mm lenses. Even the Nikon 28–70 mm lens does not work as well and if you put one on a 100 mm lens the depth of field is almost completely lost. The same thing happens if it is used on a compact camera so don't be taken in by the advertising which contradicts this.

Using the Raynox DCR-250

The camera must be set to manual mode and the automatic focus turned off. Zoom the lens to 50/55 mm, set the focus to infinity (furthest distance), pop up the inbuilt flash, set the aperture to the maximum f36–f40 and the shutter speed to the maximum flash sync—180th for most Pentax, x position for the K10D and 250th for Nikon and Canon. Holding the flowers in your left hand and the camera in your right, move the camera to focus. It is best if you hold both the specimen and the camera - with a bit of practice you will be able to take very high quality images very quickly. The amount of magnification can be varied by zooming back and changing the focus ring. The limitations are if you zoom too far back the edges of the lens will be visible and you will have a circle, or if the lens extends too far the flash will be blocked by the lens and shadow some of the subject. For obvious reasons the Raynox lens should be horizontal so as not to block the flash. Most flowers will be perfectly exposed at f40 but some darker ones will require opening the aperture a stop or two. Simply take a shot, look at the result and adjust to suit. White flowers may be overexposed so if you have a Nikon or a Canon simply adjust the EV (exposure value) to -7 or more till you get the desired result. Unfortunately, Pentax does not allow the exposure value to be adjusted in manual mode. The solution is to shape a small piece of white plastic that you can pop over the flash to reduce the output.

For this type of close-up photography a flash is essential so that there is enough light to work at high f stops. The results from the small pop-up units in these cameras give results equal to those achieved with a ring flash. This is because the flash is low down and does not throw a shadow.

Buying a Digital (SLR) Camera

If you don't own existing lenses that can be used with a digital camera I recommend the *Pentax K10D*. It is by far the best value for money, with many features that are not on either Nikon or Canon units, such as anti-shake and self-cleaning sensor. Be sure to get the basic 18–55 mm lens (it is the same price with or without the lens!) so you can use the Raynox attachment.

If you own a Nikon Macro lens then you would buy a Nikon camera. I recommend the D80 as the starting point and if you can afford it a D200 which is a very rugged professional unit. I cannot recommend a Canon as it does not offer anything more than Nikon or Pentax do and you cannot use older lenses with Canon cameras. I owned a *Canon 30D* for a short time but found it was not really as good as the *Nikon D200*, and I was so disappointed with the Macro lens that I sold the lot on eBay.

The kit lens can take good images but to get a bit more flexibility I recommend getting a *Sigma AF 18–200 mm F3.5–6.3 DC* lens. This lens is available for Pentax, Nikon or Canon and is one of the sharpest lenses I have ever used³. There is a later version called the *AF 18–200 mm F3.5–6.3 DC OS* (optically stabilised) but I have not seen it in action⁴.

Storing your images

You should always have the image settings on your camera set as follows:

- Quality-set to the highest
- Size-set to the largest
- File type-set to jpg

³ It sells for about \$450–\$500 in Australian online stores.

⁴ This sells for about \$200 more than its predecessor

I recommend using jpg files as there is so very little difference in the quality when compared to RAW images, while the extra storage required on your memory cards and hard disk is not justified.

You will need to keep at least two copies of the original and edited images and the best way to make a backup copy is on an external hard drive. These are available now in either USB, Firewire or SATA. The USB type is the most versatile as it will be compatible with all other computers⁵. For complete peace of mind a second backup disk can be stored at a friend's home and updated once a week or more, depending on how many images you accumulate.

In the field I recommend you have two 2Gb memory cards. Most people have a laptop so you can download the images each night. I also have a portable storage device which has a 40Gb (80Gb is now the basic one) hard disk and use this as a backup for the laptop. The unit I have is a *Vosonic X-Drive II*. I can highly recommend these as they can even read Nikon Raw images, and they perform very well⁶. These devices have a multi-card reader into which you simply insert the memory card from the camera and it activates the download procedure.

You definitely need some sort of database to keep accurate records of your images. I have not tried any of the free or commercial ones available as I write my own programs⁷. I store all my images with the full name of the plant so you do not have to refer back to the database to find out what it is. You can never lose track of them if you do this as a disk search for the genus will quickly locate all relevant species.

Cleaning your camera's sensor

If you do not have a *Pentax K10D* you will need to have the sensor cleaned at some time. Nikon offers one free clean in the first twelve months but if you do not live in a capital city the freight both ways may make it more worthwhile to clean it yourself⁸. If there is only one small speck of dust on a sensor I usually use the swabs a couple

of times. When cleaning the sensor be sure to select 'sensor cleaning' from the camera menu and do not use the 'bulb' setting to hold the mirror up. The sensor must be deactivated before it is cleaned.

Extended warranty

Most manufacturers only offer twelve months warranty on a camera. In Australia we now have a company that offers extended warranty on all digital cameras⁹.

Editing your digital images:

All images taken with a digital camera need to be edited. You will always get software with your camera that can do at least basic editing. The most basic things you may need to do are: cropping, brightening, sharpening and resizing. Top-end editing programs like *Adobe Photoshop* are very expensive and you would need to be editing large numbers of images to warrant the expense. The best value for money for a general graphics/image editing program is *Paint Shop Pro*. This is now owned by Corel (of *Corel Draw* fame) and is up to about version twelve. I still use *Paint Shop Pro 7* and the sample images that can be viewed from links on my website (Web ref. 8) were prepared, including the text overlay, with this program. It produces by far the best jpg images (quality for size), way ahead of *Photo Shop*, while applying text to images, like the ones in the Pentax sample page, is a breeze.

If you use jpg images in your camera I would recommend you buy the *Nikon Capture* software. This does not come with a Nikon camera so you have to purchase it separately¹⁰. It is an extremely good program for editing jpg images and I use it for all my jpg images, including those taken with the Pentax. It can also edit Nikon RAW images, though not very well. Working in RAW mode used to be a breeze when there was a brilliant free program called *RawShooter Essentials*. There was also a 'pay for' version called *RawShooter Premium*¹¹. This is the one I previously used for

⁵ Some prices for these at the time of writing from the web (Web ref. 4) are: *Seagate 500Gb USB* \$214.95 and *Western Digital 320Gb USB/Firewire* \$194.95.

⁶ Prices for these from the web (Web ref. 5) are \$259.00 (80Gb unit) and \$325.00 (120Gb).

⁷ One I found on the web is *PixFiler* which costs \$US39.00. It looks like it would do a good job but if you do a Google search I am sure you will find many more.

⁸ Cleaning kits can be purchased from Nulab Professional Imaging (Web ref. 6) and cost \$88.00 for a packet of 12 swabs, \$25.00 for the cleaning solution and \$20.00 postage. It normally costs at least \$80.00 plus freight to have a sensor cleaned so for \$133.00 you can do at least twelve cleans.

⁹ The company is PhotoTechnical (Web ref. 7) and they are situated in Brisbane. Their contact details are:- Phone 1800634322, Fax 0733581663 or carol@phototech.com.au.

Even though their web site is aimed at dealers, you can purchase a warranty direct from them anytime that the factory warranty is valid and they offer up to four years extended warranty. All repairs under this warranty are carried out by the company. If you sell a camera before the extended warranty has run out you can transfer it to the new owner for \$11.00.

¹⁰ You get a trial version to tempt you. It costs about \$250.00 from Australian stores or \$200.00 from Hong Kong (on eBay).

¹¹ This sold for \$US99.00

all my RAW images. Unfortunately, Adobe saw it as a threat and took them over. The *RawShooter* technology is, supposedly, included in the new Adobe program *Light Room*. Registered users of *RawShooter Premium* received a free copy of this new program but I find it is very complex and is much more expensive than *RawShooter* was.

Because I take very large numbers of images and need to process them quickly I have decided to use jpgs and edit them with *Nikon Capture*. The images are finished off in *Photo Shop*, but you could use *Paint Shop* to do the same job. When you process large numbers of images you need to have an organised system.

This is what I do.

The images are shot as full size jpgs and downloaded to the computer with *Nikon View* to a separate folder each day. The folders are named with a number at the start (to keep them in order) and some extra words that will identify the images, such as "IMG1036-Noahdendron-24-12-06". Each image is passed to *Nikon Capture* for editing, then on to *Photo Shop* for resizing and perhaps a small touch-up. It is then saved as a tif file in a sub-folder called 'edited'. A record of all images is kept in a database with the name of the plant and all the file names. The file name is copied from the data base and pasted into *Photo Shop* so there is no chance of an error. The full size jpg is then saved from *Nikon Capture* with the same number as the camera issued it with, plus the allocated file name, such as "IMG1024-Archidendron lucyi-11". I then have the original un-edited jpg file, a cropped and resized tif file, and an edited jpg file for each image. After each batch is processed I then use *Paint Shop* to convert the tif files to jpgs and these are placed in a sub-folder under the 'edited' folder. These files are then backed up onto an external hard drive. The jpg files are copied to another internal hard drive and placed in a few large folders. I have found most programs stall if more than 8000 images are in one folder. Hard disk prices have crashed in the past twelve months and a 500 Gb drive can now be purchased for about \$200.00.

The Nikon program *Nikon View* is free and is worth downloading from any Nikon web site. With it you can download your jpg images from a memory card reader or camera, view them, and if you right click on an image (or images) and select 'edit' the image will be passed on to *Nikon Capture* (or any other program that you nominate, such as *Paint Shop Pro*) for editing. I highly recommend using the *Nikon View* program as it does a brilliant job.

There are free editing programs available and a well known one is *The Gimp*. I found it very

complicated (even more so than *Photo Shop*) and gave it the flick.

Editing using *Nikon View* and *Nikon Capture*

Once you have installed the software (*Nikon Capture* first) you need to set the preferences. Start *Nikon View* and click on 'Edit' then 'Preferences'. The first tab will be for auto launch. Click to select 'Auto launch when connected to a camera or card'. Click on 'Thumbnails', and making sure cache is on, move the cache slider to 100 mb. Then click on 'Still Image'. This is where you tell *Nikon View* which program to use for editing. If *Nikon Capture* is installed this will be selected, if not you can select another program such as *Paint Shop Pro*. The other settings can be left at their default values. For *Nikon Capture* the default settings are quite OK. However, if you do not have *Photo Shop* you should set the options for 'Open saved images with' to *Paint Shop Pro*, if you have it, or otherwise the software that came with your camera. You will mainly use this software for resizing the image.

Simply plug in your camera to the computer or insert your memory card into your card reader and *Nikon View* will fire up 'Nikon Transfer'. The first time you use this program it will want to save the images in the 'My Pictures' folder under 'My Documents'. Use this folder if you like or click on the change button to set another folder. The program will remember the settings. Just click on the zig-zag arrow and the images will be downloaded and *Nikon View* will open with thumbnails of all the images. You can double click on an image to see it full size or right click and select 'edit' to open the file in *Nikon Capture* for editing.

In *Nikon Capture* I arrange the image window to take up about $\frac{3}{4}$ of the screen with the tools stacked along the right hand side of the screen in the last $\frac{1}{4}$. Before you do any editing you need to sharpen the image with the Unsharp Tool. If it is a macro shot (close up), set the intensity to 30-60. The Halo width should be left on 5 and the threshold on 0. If you sharpen the image after you have edited the colour and brightness it can introduce noise. The 'Curves' tool is the most important one of all. (Fig. 3) The 'auto' button is the half black/half white circle second from the top. Click on it. Sometimes the picture will then look perfect. If you have white flowers in the image it does a very good job. If the flowers are cream and the auto adjustment changed them to white, select the 'blue' channel from the 'rgb' tab and drag the vertical line to the right by clicking and dragging on the triangle at the bottom of the line, till the colour is correct. If the image is overexposed after using the auto button

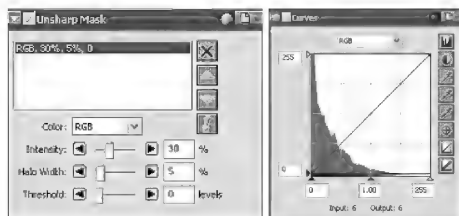


Fig. 3. Unsharp Mask and Curves editing tools in a typical image editor.

select each colour (blue, green, red) and reduce each of them. In a perfectly exposed image the colour markers in the rgb lines should be (from the left) blue, green, red, about equal spaces from each other. If your image has yellow flowers with foliage the result will be overdone with blue. Select the green curve to see where it is and then select the blue one and drag it back towards the green one till the blue haze has gone. You may then need to nudge the green and red back a bit. After a bit of practice you will be able to do this in a few seconds.

Once you have adjusted the image to your liking you can then select the area to be saved (crop it). Select the 'Crop' tool (the dotted square) and click and drag to mark the area of the image that you want to keep. The image will not be cropped till you save it. If you have *Photoshop* you then click on the *Photoshop* icon on the left and it will be transferred to that program. If you are using another program click on 'File', 'Save As', type in a name for the file and hit enter. The file will then be saved and opened in the program you selected in the options. If you are in *Paint Shop Pro* select 'Image' then 'Resize'. I would suggest 1200 pixels wide is a good size. Make sure 'Resize all layers' and 'Maintain Aspect Ratio' is selected and 'Bicubic Resample' is the selected method. Do not enter a height as this will automatically be selected to maintain the correct aspect ratio. Click OK. Just click Save, and the image is finished. If you are using the software that came with your camera the selections should be almost the same. With *Paint Shop Pro*, make sure the jpg compression ratio is set to 10, this is 10:1. At this setting there is no noticeable loss of quality. The image will be degraded at 20:1 or more. I then save the image in *Nikon Capture* to a new file name with the plant name attached to

the original number. This enables me to come back at a later time and re-do the original file from scratch, if necessary.

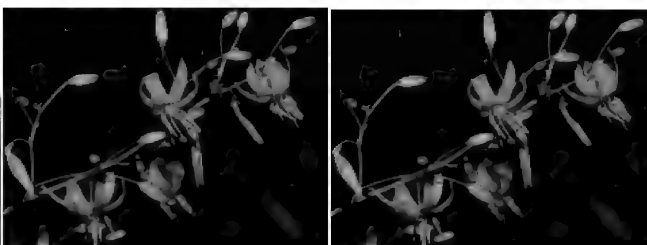
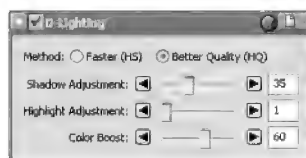
In the Curves tool the three slider triangles along the bottom represent, from right to left, Highlights, Mid-tones and Shadows. If you have a small amount of noise just pull back the shadows control and it will vanish. Most images improve with a small reduction in the shadows level. This darkens the background and makes the subject stand out more clearly.

If you have white flowers with green foliage and have exposed for the flowers, the leaves will be quite dark. To improve this just increase the mid-tones a bit by sliding the control to the left. This will increase the exposure on the leaves without overexposing the flowers. If your image does not contain any white or yellow objects you can click on the centre of the curves line and push it to the top left. This increases the light on all colours. Too much will introduce noise, so be careful.

Another tool in *Nikon Capture* that often produces good results is the 'D-Lighting' tool (Fig. 4). Usually the best results are produced with the 'Better Quality' button. If too much light has been added pull back on the 'Adjustment' slider. Two other tools that you will need from time to time are Noise Reduction and LCH Editor (Fig. 5). If the background of the image shows grain you can apply a small amount of noise reduction. Values from 2 to 5 are suitable and will not reduce the sharpness too much. The Master Brightness of the LCH Editor is similar to the Curves tool but the most useful part of this tool is the Chroma (colour). With this you can strengthen or weaken the overall colours by clicking on the outside section of the bar and sliding it up or down. To work on a particular section of the colour spectrum click on the bar at the appropriate section and drag it up or down.

If the image is almost the way you want it, you may only have to apply sharpening, so nudge up the mid-tones and pull back a bit on the shadows.

Fig. 4. The *Nikon Capture* D-Lighting tool. Results before (left) and after (right).



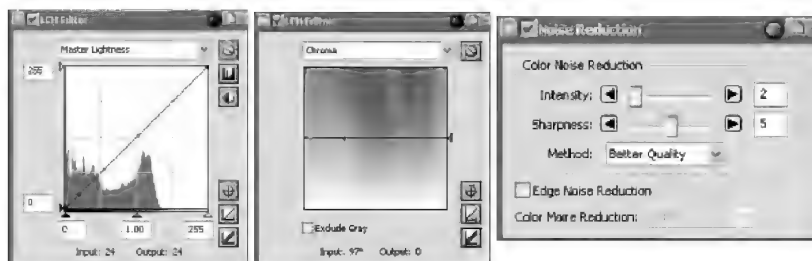


Fig. 5. Left, LCH Editor tool's Master Lighting and Chroma options; right, Noise Reduction tool.

This only takes a few seconds so if you have to process large numbers of pictures you can get them as near to perfect as possible in a relative short time. Overall, it is best to have your images slightly underexposed. Nothing much can be done with overexposed jpg images. If they are too dark though, noise will be introduced if you have to increase the light by a large amount.

For example, the pictures in Figure 6 show the before and after editing. The one on the left is the original which has too much red in it and is nothing like the true colour of *Syzygium papyraceum*. By increasing the blue and reducing the red with the Curves tool the result on the right was obtained. Purple and blue are difficult colours for all cameras—even with film it was the same.

Another example is seen in Figure 7. The picture on the left was seriously underexposed but just by sharpening and using the auto button on the Curves tool the image on the right resulted. If I had used the mid-tones slider to increase the exposure on the leaves it would have shown some noise, but as it is, it is an acceptable image.

This is the same picture with light increased on the leaves with the mid-tones slider and a noise reduction of 2 applied. This is also an acceptable image, so don't be too quick to delete an image that is underexposed if it is the only one you have.

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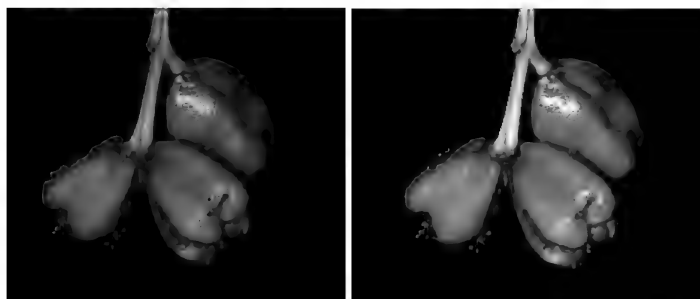


Fig. 6. Result (right) of increasing blue and reducing red with Curves tool.

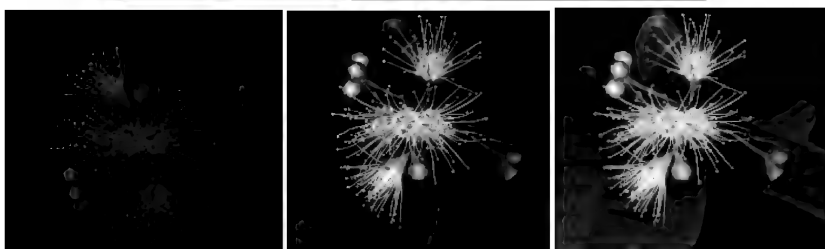


Fig. 7. Taking underexposed image (left), utilising Curves (mid), then adjusting mid-tones (right).

The *eFlora of the Sydney Region*: 'shortening the distance between discovery and delivery'¹

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Murray Henwood, School of Biological Science, University of Sydney

Rowan Brownlee, The University of Sydney Library

The vital role of taxonomy and systematics in the conservation and management of global biodiversity has been highlighted by the Global Taxonomy Initiative (GTI: Australian Biological Resources Study 1998) and other authorities (May 1990; Thomas 1991; Morrison 1992; House of Lords 2002; Mace 2004; Wilson 2004; PEET, Web ref. 1; Stephens 2007).¹

Despite its critical importance, the discipline has undergone a sustained decline (Thomas 1991, Raven 2004; Wheeler 2004; Olmstead 2006). This 'slow down in taxonomic work' has been acknowledged by governments around the world as an impediment to the conservation of biodiversity (Gaston & May 1992; Crisci 2006). The increasing pressure on world biodiversity and the decline of fundamental skills in species identification and description create an imperative to encourage the development of these skills in the next generation of taxonomists and environmental managers. Prather *et al.* (2004) articulated the effect that the decline in floristic studies is having on land management and conservation decisions in the United States. There is a need world-wide to develop new approaches to teaching that aim to inspire students and support essential activities in environmental management (Godfray 2002 & 2004; Gotelli 2004; Stephens 2007).

The challenge of addressing this problem at a world wide level are large and need to be supported by global organizations and initiatives. However there is much that can be done at a regional level to contribute to the training of systematists and ecologists and the understanding of biodiversity. Indeed these regional initiatives are an essential means of reversing the decline in the skills development of taxonomists and environmental managers.

A project that aims to achieve this has been developed by the University of Sydney and the University of Wollongong, supported by funding from the New South Wales Environmental Trust. The *Flora of the Sydney Region* (Carolin and Tindale 1994) is being revised, updated and digitised to form the centre-piece of a multifunctional, web-based resource (the *eFlora*) for the presentation of information on botanical diversity.

The *Flora of the Sydney Region* was first produced as a teaching resource in 1940 by P. Brough and J. McLuckie. Known then as '*A key to some of the plants of the Sydney Region*' it was later expanded by Beadle, Evans, Carolin and Tindale in a number of editions, starting in 1963 (Beadle *et al.* 1963, 1973, 1982, 1994) to include all native and naturalized species and became an authoritative resource for teaching and ecological survey. Unavailable since the late 1990s, the Sydney Flora is being re-vitalised using new computer technologies. Morphology-based taxonomy is ideally suited to digital communication and the development of the internet and digital image banks provide an opportunity to present the Flora to a wider audience of students, professionals and amateur naturalists (Godfray 2002, Gotelli 2004)

An important aim of the *eFlora* is that it should reflect the content of the *Flora of the Sydney Region*, but with enhanced operability. To this end the glossary component of the *Flora of the Sydney Region* will be marked-up in Extended Mark-up Language (XML) and linked to the dichotomous key format of the revised original Flora text by way of automatically hyperlinked keywords from the glossary. This format will ensure that the glossary can be used independently of the *eFlora* (for stand-alone teaching purposes) or can be integrated with other botanical information services. The *eFlora*, and associated glossary, will access objects within *eBot* to aid in plant identification. *eBot*, a digital repository of research and learning objects currently being developed by the University of Sydney, will provide a sustainable, standards-based repository for digital objects sourced from fieldwork, existing collections and via conversion from physical formats.

The revised flora text is also coded in XML and formatted in an adapted ABRIS schema (Web ref. 2). The electronic format allows outputs for a variety of uses including print and web publishing. As well, changes in nomenclature and classification will be quickly conveyed to users. A 'pathway' capability is also proposed to enable users to navigate backwards and forwards through their key choices to resolve identification errors.

eFlora will provide a more efficient, user friendly and resilient format for a proven training and information resource. It will promote discovery and delivery at a regional level facilitating better

¹ From the Global Taxonomy Initiative (Australian Biological Resources Study 1998).

teaching outcomes and providing a better tool for biodiversity conservation.

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Collection and curation of material of *Dianella* Lam. ex Juss. and *Rhuacophila* Blume (Hemerocallidaceae) for herbarium and living collections

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The monocot genus *Dianella* Lam. ex Juss. (Hemerocallidaceae) has traditionally been considered to be a small genus with c. 30-40 species (Henderson 1987; Clifford et al. 1998). *Rhuacophila* Blume was subsumed within *Dianella* by Kunth (1850), Schlittler (1940, 1948) and by Jessop (1979) but it is abundantly distinct from *Dianella* (Henderson 1991; Clifford et al. 1998; Carr 2006a) and probably closer to *Stypandra* R. Br. and *Thelionema* R.J.F. Henderson. The type of *Rhuacophila* is *R. javanica* Blume and the genus is allegedly monotypic (Clifford et al. 1998) although three species and four infraspecific taxa have been described. On current indications there are likely to be at least five species, accepting at least three species or infraspecific taxa described from Indonesia (see Jessop 1979) and at least

two undescribed species from Bornean Malaysia (Carr 2006a, unpubl. data).

Approximately 100 valid names have been published in *Dianella*, many at infraspecific rank (e.g. Henderson 1987), most of which require elevation to specific rank. There has been a spate of species described in recent years (Henderson 1987, 1991; Carr and Horsfall 1995; Carr 2006b; Heenan and de Lange 2007) and in excess of 250 new taxa await description (Carr 2007a; Carr and Horsfall unpubl. data). Most of these are Australian but at least 14 undescribed species occur in Malaysia and Indonesia (Carr 2006a, 2007b, unpubl. data). Some statistics illustrate this trend in increasing recognition of taxa : 34 *Dianella* taxa are now known from Victoria (Carr 2007a) rather than the 10 accounted for by Conran

(1994) and Carr and Horsfall (1995); similarly, five *Dianella* species and two *Rhuacophila* species occur on Mt Kinabalu, North Borneo, rather than one *Dianella* and one *Rhuacophila* (sensu Beaman and Beaman 1998) (Carr 2006a, 2007a, submitted).

Dianella is overwhelmingly Australian where it has radiated extensively into diverse environments, apparently from rainforest stock. It is inferred to have dispersal, via birds, from Australia, New Guinea, New Zealand and New Caledonia to south-east and south Asia, continental Africa (one species) and the Pacific Basin as far east as Hawaii and Pitcairn Islands (Carr in prep.). There are numerous island endemics in the Pacific and many fairly narrow endemics elsewhere, including mountains in tropical south-east Asia. *Rhuacophila* is much more restricted, occurring in Malesia, Fiji and New Caledonia.

The reasons for the massive discrepancy between the total described taxa and the actual number of *Dianella* species was outlined by Carr (2007a); far from being a small genus, it is one of the most speciose in Liliaceae with at least 350 species. The reasons *Dianella* and *Rhuacophila* have been so poorly served in taxonomic and floristic accounts are as follows:

1. Dried herbarium material has almost always been poorly collected and curated with scant data other than location and collector. Even well-pressed and well-curated material loses the colour of most or all organs; great weight is placed on colour (see Table 1)
2. Collection and curation of herbarium material in the humid tropics is notoriously difficult.
3. The biology of *Dianella* and *Rhuacophila* is such that special techniques (notably for floral material) as well as types of data are required to collect useful herbarium material.
4. Much of the taxonomic work on *Dianella* and *Rhuacophila* has been carried out by taxonomists unfamiliar with living material and often remote from collection locations (e.g. Schlittler 1940; Jessop 1979; Henderson 1987).
5. Flora accounts are frequently uncritical reiterations of previous work, e.g. Conran (1994) and Wilson (1993) following Henderson (1987).

In this article I describe the collection techniques appropriate for *Dianella* and *Rhuacophila* material to make herbarium and living collections, and the kinds of data required to accompany the collections. My aim is to enable field collectors to make maximally useful collections, and to encourage wider collection of *Dianella* and *Rhuacophila* in the hope of rectifying the woefully inadequate state of the current taxonomy - countries with naturally occurring *Dianella*

and *Rhuacophila*, and those with naturalised *Dianella*.

Character states and biology of *Dianella* and *Rhuacophila* relevant to collection of material

There is a very large suite of qualitative and quantitative macroscopic and microscopic, characters and character-states in *Dianella* enabling the recognition of taxa and ready discrimination between them. Continuous variation in vegetative and fertile characters, as implied by the literature, is not a feature of *Dianella*, contra Jessop (1979) for example, who synonymised a heterogeneous group of 17 *Dianella* species under *D. ensifolia* (L.) DC., the type species, which was collected in India (Henderson 1987). Vegetative and fertile character states in *Dianella* are outlined in Table 1 to illustrate the range of characters available, and to indicate the appropriate collection methods outlined below. *Rhuacophila* is very poorly known and it is not discussed further, however most comments that apply to *Dianella* apply to *Rhuacophila* and these should guide all collectors dealing with *Rhuacophila* in the field or live plants in cultivation.

The general morphology of *Dianella* is outlined by Henderson (1987) and Clifford et al. (1998) and an understanding of the floral biology of *Dianella* is critical. Flowers of *Dianella* are evanescent and in all species, except the *D. tasmanica* Hook. f. group, flowers open and collapse on day one; they do not remain open for more than about four to six hours. In the four species of the *D. tasmanica* group (three undescribed) flowers span two days (Carr unpubl. data). At the end of anthesis in all *Dianella*, the cells of the perianth and staminal tube lyse and liquefy, thus most *Dianella* collections, pressed at the end of the day, have few if any useful floral features available in the pressed material. Such floral material cannot be reconstituted by soaking. This aspect of floral biology is a major reason the taxonomy is inadequate. It is also the reason why almost all collections I have inspected in diverse herbaria (e.g. AD, BO, MEL, NSW, SNP) would not serve as useful types, despite the fact that numerous new species are represented in the collections. The adequate circumscription of taxa from such material is not possible.

Collecting *Dianella* material

Collecting material for dried herbarium collections (including vouchers for live collections), and the accompanying data required is outlined here for flowering and fruiting plants. Material should consist of at least one fertile shoot, including rhizome and roots. Ideally two or more shoots are desirable depending upon size. Rhizomes and

Table 1. Important characters and character states in *Dianella*

Characters	Notes
Habit	Evergreen, rarely deciduous or facultatively \pm deciduous (during drought conditions) perennial herbs; habit in species ranges from densely caespitose (very short rhizomes) to 30 m or more wide (sympodium long-rhizomatous) (diagnostic features).
Roots	May be short and tuberous (rarely) (<i>D. rara</i> R. Br), long fibrous-tuberous, to fibrous; the type of roots is species specific; the colour of roots is not usually diagnostic (diagnostic features).
Rhizomes	The length of rhizomes – short (few mm) to long (\pm 1 m) – is diagnostic but may not be expressed in young plants; rhizome diameter as well as the colour and texture of cataphylls may be diagnostic. Rhizome architecture is essentially undocumented, but clear differences exist (e.g. combination of short shoots and long shoots) and should be noted (diagnostic features).
Fertile shoots	Laminate leaves of each fertile shoot range from 0, to 1 to 22 depending on species (highly diagnostic). Shoots may be \pm acaulescent to long-caulescent (stems to \pm 2 m or more), high unbranched, or with 1-2 orders of extra-vaginal branching. The diameter and shape of stem in transverse section and internode distance are important (highly diagnostic).
Leaves	Leaf (sheath and lamina) size; shape; colour(s) (abaxial and adaxial sides); texture; glaucousness; anatomy; micromorphological surface features; whether blade \pm plane, channelled or revolute; degree, type and distribution of epidermal 'teeth' on abaxial midrib and leaf margins (highly diagnostic).
Inflorescences	Size, shape, length, angle and posture of branches, shape in cross section; colour of scape and branches, epidermal projections; number of flowers and arrangement on cymule are diagnostic and very variable between species. Inflorescences are rarely somewhat perennial, i.e. capable of remaining alive to initiate a second round of flowering in the following year or subsequent to the first flowering bout (highly diagnostic).
Flowers	Numerous floral features are highly significant and show little variability, e.g.: number of flowers per cymule; presentation of flowers (pendant, subpendant or lateral); length of pedicel and shape in transverse section; size, shape and colour of tepals; time of opening of flowers - from c. 0600 to 1700 hours; eugenol floral fragrance (detectable in few species but diagnostic); features of anthers – length and shape of filaments, size and shape of strumae, size and shape of anthers – and colours of these organs; and size, shape, colour and number of ovules per ovary loculus (highly diagnostic).
Fruits	Size, and colour of fruits (berries) is important; they are almost always intense violet-blue, rarely in some species green, white, orange yellow or blue-black. Texture of fruits is very soft, or rarely quite hard (green fruited species). Ripe fruits may be firmly attached to the infructescence (pedicels) or \pm caducous (dislodged at a touch) (highly diagnostic).

roots must be dug from the substrate/soil; shoots pulled from the substrate will often leave the rhizome and roots behind.

This material is pressed in the conventional way according to techniques appropriate to tropical or temperate zones, but special procedures are required for flowers (see below). Inflorescences, if large, are best cut off with most of the scape and pressed separately. Leaves, if large and/or numerous, can be cut from one side of the shoot and discarded. Leaves and inflorescences are arranged to best and unambiguously display

salient features and facilitate drying, rather than bunched up, or organs excessively superimposed.

It is essential to apply sufficient pressure in the press to ensure leaves are held flat until dried. If not held flat, leaves of most species will become severely revolute with margins curled on drying. Drying in pressed *Dianella* is fairly slow (without artificial heat) but plants should only be removed from the press when thoroughly dry, otherwise leaf margins will rapidly become revolute.

Flowers, which are evanescent and fragile, are individually cut from pedicels and pressed

separately between soft materials, ideally tissue paper between foam 'rubber' sheets, so that organs are pressed flat without shrivelling. Flowers are often pressed (by me) in a book rather than in a press. Drying of flowers under these conditions is rapid (1-2 days). Flowers should be pressed as soon after opening as possible; perianth margins of late-picked flowers can begin to lyse. The perianths and anthers of pressed flowers can be measured because they do not shrink if well pressed. Dimensions of strumae and features of the filaments must be obtained from reconstituted (rehydrated) flowers.

Fruits (or some fruits) are detached and air dried to avoid crushing in the press; collect a range of fruit sizes (often quite a variable feature depending on the number of seeds matured.).

Collecting live material

Comparative study of live (cultivated) plants has been absolutely crucial to our taxonomic studies of *Dianella* (Carr and Horsfall 1995, Carr 2006b), additionally many species have been described from cultivated plants (e.g. Henderson 1987) and many will be described from cultivated material. There are for example at least 10 undescribed cultivated species in Indonesian botanic gardens and many of these have provided type material for new species (Carr unpubl.). Most species are readily cultivated by mimicking the general conditions they experience in nature. At least three shoots with attached rhizome(s) are desirable from each plant collected; material must be dug up to ensure roots are attached and the rhizome is undamaged. Potted plants are placed in a closed environment (e.g. large plastic bag) to prevent desiccation until roots are initiated (generally 3-6 weeks), thus allowing water uptake in the plant. Cultivated plants are kept in containers or planted in the open ground. It is desirable to collect several individual plants (3-5) from a population to test within - population variability (typically very low) and facilitate outcrossing if plants are to be used as a source of seed for propagation, although *Dianella* are highly to moderately self-fertile (cf. Duncan et al. 2004).

Data to accompany collections

Aside from the usual data accompanying collections such as date, location, and collectors (see for example Albrecht 1993) certain other data are essential for material to be maximally useful for taxonomic purposes or enable accurate identification or circumscription.

Great weight is placed on features of *Dianella* plants which cannot necessarily be determined or are often inevident in herbarium collections, or are always lost on drying. These include (Table 1): habit of the plant and colour of various organs, especially leaves, flowers (perianth, androecium

and gynaecium) and fruits. In formal descriptions (Carr and Horsfall 1995; Carr 2006b) colours or organs are given according to the 1986 reprint of the Royal Horticultural Society Colour Chart (RHS London, and Flower Council of Holland, Leiden). In the absence of a colour chart, colours are accurately described and good-quality photographs, including close-ups (macrophotos) of opened flowers are essential. Photographs must be lodged with the herbarium material. Note that leaves, flowers (and occasionally fruits) have several colours per organ: abaxial and adaxial sides of leaf, and often with various markings on leaf bases or sheaths (e.g. Carr and Horsfall 1995; Neenan and de Lange 2007); perianth, and perhaps filaments. The strumae and anthers, ovary and style are usually concolorous. The glaucousness of the leaves (non-glaucous to highly glaucous) is a very important feature to note.

The habit of mature plants is crucial information: height of plant and branching patterns, and width of the whole plant measured or estimated at the outside bases of shoots; posture of leaves (e.g. stiffly erect, lax, arcuate). Photographs of in situ plants are very valuable.

Dimensions of floral organs and fruits

The time of anthesis, that is diel flowering time, is often very important and sometimes diagnostic and should be noted if known. Flowers in some species open as early as 0600 hours (e.g. *D. caerulea* Sims var. *assera* R.J.F. Hend.), while in others they do not open until very late in the day, e.g. in *D. tarda* P.F. Horsfall and G.W. Carr flowers open at c. 1700 hours. In all species except the *D. tasmanica* complex, flowers last from 3-6 hours only, after which they collapse.

Assuming flowers have been individually pressed and dried, or wet collections made and fruits dried, the dimensions, shape and proportions of all floral organs can be measured and described (by subsequent users of the material) from rehydrated or wet-collection flowers, ideally in conjunction with photographs. Flowers immersed in hot water with detergent rehydrate fully within a few minutes; fruits take longer. Fruits do not require rehydration to remove seeds for examination, scanning electron microscopy, or to count ovules or seeds. Wet collections of flowers or fruits are preferable but the perianths of flowers always close somewhat when immersed in alcohol; the in vivo posture of perianth segments (sometimes diagnostic) is lost, hence the desirability of photographs of fully-opened flowers. Flowers only open fully, with characteristic reflexing of tepals, when temperatures are optimum, which may not occur on all days during the flowering season especially in plants cultivated in colder climates compared with those in which they naturally occur.

Ecological data and notes

It is important, often aiding greatly in identification or interpretation of the material and of its taxonomic position, to collect some information on the environment and vegetation community in which the collection is made. Some *Dianella* species have a very broad ecological amplitude and occur in a range of quite different environments. By contrast, other species are very restricted narrow-endemics confined to specific geologies, substrates, vegetation communities and altitudes. Where plants are collected for cultivation the environmental information may be particularly important to enable conditions to be mimicked in cultivation.

The following information is thus considered important to accompany collections: geology, soil type, vegetation community/subcommunity and or associated plant species, conditions e.g. sun/shade, soil moisture relations and animal-plant interactions.

Summary

Most herbarium collections of *Dianella* are very inadequate, i.e. poorly collected, poorly pressed and often poorly curated. They invariably lack adequate or comprehensive data (e.g. habit, colour of salient organs) and such material is the principal reason for the grossly inadequate taxonomic accounts of a genus which is about and order of magnitude more speciose than currently acknowledged.

To rectify this situation I outline here the kinds of material and data that need to be collected by botanists/collectors, and some special protocols for collecting, notably to sample the evanescent floral material and note in detail the colour of various organs. These protocols apply for dry herbarium material and vouchers for living collections.

Collectors are urged to provide the following material and data:

- Sample several plants in the population
- Collect one or several fertile shoots with attached rhizomes
- Whole, well-developed inflorescence may need to be detached from their shoots if large, and pressed separately
- Individually press flowers cut from the pedicel as early as possible after opening, alternatively make wet collections of flowers (and fruits)
- Fruits, which are air dried or wet-collected
- Data on colour of organs ideally using standard colour charts, viz.: leaf surfaces (abaxial and adaxial) as well as colour of markings on leaf, sheaths, and margins or bases as relevant; colour of scape and inflorescence branches and pedicels; colour of floral organs – perianth (abaxial and adaxial, including markings, e.g.

veins), filaments, strumae, anthers, ovary, style; and ripe fruit.

- Diel anthesis times: time of day flowers open and time of the day they close
- Floral fragrance (if detectable)
- Habit of plant, including diameter (at outside shoot bases) and branching patterns of aerial shoots if present are characteristic, as are posture, texture, etc of leaves
- Photographs of in situ plants, macrophotos of flowers and of fruits.
- Data on the geology, substrate type, vegetation community and other environmental details as relevant.

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GrassWorld update

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The main informaton on the *GrassWorld* is published in the current issue of *Kew Bulletin* (Simon 2007), this being an account of the project as it stood in July 2007. The paper was first submitted two months after the Linnean Society and Royal Botanic Gardens Kew symposium *The Celebration of Grasses* in September 2005, to commemorate the retirement of Steve Renvoize from the staff of the grass herbarium at Kew. Since then the information on the history and scope of the project in Powerpoint form (Web ref. 1) has been updated a number of times as more ancillary data has been fed into the database. Prior

to the Kew symposium in 2005 the Powerpoint document was presented at the Singapore Botanical Gardens, University of Cape Town, the National Botanical Institute, Pretoria and after the Kew symposium to the ASBS Symposium in Brisbane. In 2006 it was given at the Missouri Botanical Gardens and the Smithsonian Institution and in 2007 at the National Science Museum of Japan and recently an update of *GrassWorld* at the ASBS meeting in Darwin.

GrassBase is the current name of the DELTA database of the morphology of the world's grass species at Kew (Web ref. 2). This has been freely available from Kew since 1997 and is the culmination of many years input by Derek Clayton, ably assisted in recent years by Helen Williamson and Kehan Harman. The Australian subset of this dataset was the basic set used to build *AusGrass* (Sharp & Simon 2002), with the DELTA data being transformed into the Lucid format. *GrassBase* currently has nearly 11,000 species coded for their morphological data, representing about 90% of the world's flora. At present the morphological data of *GrassWorld* is exactly the same as that in *GrassBase*.

In addition to *GrassBase* the Kew team have put together an Access database of the complete synonymy of the world's grasses, currently holding more than 60,000 names. This is currently downloadable and able to be used offline but plans are underway to cross-link the names to *GrassBase* online (K. Harman pers.com.). Within *GrassWorld* only basionyms and recent common synonyms are included, but it maybe possible to link the Kew synonym database directly with *GrassWorld* as well.

It is anticipated that *GrassWorld* and *GrassBase* will ultimately end up as one world database from which it will

Table 1. Progress in the *GrassWorld* project

		2005	2007
Morphology (GrassBase)	K	c. 90%	c. 95%
Author & where published (BRI)	BRI	c. 80%	c. 96%
Source of coding (rough) (K)	K	c. 80%	c.86%
Source of coding (exact) (BRI)	BRI	—	1%
Reference to published illustration	BRI	c. 30%	c.37%
Reference to published photographic image	BRI	c. 10%	c. 10%
Scanned image of type (herbaria)	BRI	—	—
Locality and details of type specimen			
of basionym	BRI	c. 15%	52%
Derivation (from Clifford & Bostock)	BRI	c.50%	c.88%
Chromosome number	BRI	c.1%	c.1%
Level 3 TDWG coding	BRI	c.60%	c.80%
Level 4 TDWG coding	BRI	c. 28%	c.28%
GBIF entry	BRI	--	—
Genbank entry	BRI	--	—

be possible to generate online descriptions of all included species and genera and to run interactive keys in both Intkey and Lucid formats. It is possible to do that now with both databases with the information at hand; an appropriate time to launch the first version of *GrassWorld* online will probably be when the entry of information to the database pertaining to the protologue of the basonym is completed. This is being sourced from both TROPICOS and the Kew Synonym database, depending which has the more complete or appropriate information.

One of the main issues that will have to be resolved before the merger of *GrassWorld* and *GrassBase* takes place will be which species name is presented as the acceptable name. This is especially pertinent at the present time when there appear to be many actual and potential changes in generic circumscription following phylogenetic analyses. Currently many species are accepted under different names by different institutions for different reasons, but as long as these names are crossed-linked a solution to this problem could be overcome. At present the names being used in *GrassWorld* reflect the names being used by the main grass institutions of the world or in recent literature for different regions of the world. For example for the New World names follow Catalogue of New World Grasses (Judziewicz et al 2000; Peterson et al 2001; Soreng et al 2003; Zuloaga et al 2003), for tropical Africa, the Indian subcontinent and south-west Asia names are those used at Kew, for Australia *AusGrass* (Sharp & Simon 2002) is the reference used, the new *Flora of China* grass volume (Shouliang C. et al 2006) for China and for south-east Asia names are generally those used in the *Flora Malesiana* manuscripts (J.F. Veldkamp, pers. com.).

The method by which distributions of grasses will be depicted will depend to some extent how sophisticated real time distribution software is developed. Originally it was thought that shading in the particular TDWG region where the species occurs may suffice to indicate the occurrence of the species from that particular region, but if

dot map technology using distribution software used by GBIF and AVH can be used globally that would probably be preferable. There is currently a great imbalance in the regions of the world covered by this data, with Europe, the USA and Australia having the best coverage and areas of tropical Africa, Siberia and Greenland the worst coverage. Other regions have poor to moderate coverage.

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Corrections to article on 1840 Drummond letter in Newsletter 131-2

R.M. Barker

State Herbarium of South Australia

Since the reproduction in the last issue of the ASBS Newsletter of the 1840 letter from the Gardeners Magazine on emigration with reference to gardeners and botanical collectors there has been debate from Philip Short and Alex George on the identity of the "poor Drummond" mentioned in the text. It does appear much more likely that

the Drummond referred to is not actually James, but his brother Thomas, who botanised in North America before dying in Cuba in 1835 while on a collecting trip there.

And the letter did not come from Australia as indicated in the heading to the item!

Obituaries

Vale Helen Joan Hewson 1938–2007

Helen Joan Hewson.
Born Benalla June 24, 1938;
died Canberra October 29, 2007.

Redoubtable Australian botanist Dr Helen Hewson died on October 29, 2007, after a long battle with cancer. Helen was an extraordinary friend and colleague to three generations of Australian botanists, a leader in the study of Australian plants, a nationally acknowledged dog breeder and judge, and an accomplished author and botanical artist. In all her areas of interest, Helen was an inspiration to her friends and colleagues and a gifted teacher. She will be remembered by all who met her for her quick wit and ready, loud, infectious and distinctive laugh.

How many of her botanical friends knew of her multiple and diverse career paths and interests? By profession Helen was indeed a botanist—one known to almost every other taxonomic botanist in Australia through her long association with ABRS and the *Flora of Australia*, and with the Australian Systematic Botany Society. But her personal interests were much broader.

Helen was born in Benalla, Victoria (about which she was particularly proud), and matriculated from the high school there before undertaking university studies first in Melbourne and then at the University of Sydney. She completed her B.Sc. with first class honours, followed, in 1967, by a PhD in the cytogenetics and taxonomy of the thallose liverwort family Aneuraceae; although working on many other plant groups, Helen never shed her interest in this particular group of plants. Later in her career Helen also graduated with a BA in Professional Writing in 1985 from the Canberra College of Education.

Helen came to Canberra to teach in the Botany Department of Australian National University;

teaching and inspiring new generations of botanists was a passion she held throughout her career. In 1975 she took up a grant from the Australian Biological Resources Study to develop sample treatments for *Flora of Australia*, using Brassicaceae and smaller families as models. This was the start of her considerable impact on the literature of Australian systematic botany. Working with Alex George, Helen was

largely responsible for the model or template for descriptions, the 'immutable gold standard', for *Flora of Australia* descriptions which is still used today with only minor modification.

This initial demonstration project quickly evolved into detailed taxonomic research in Brassicaceae and Helen was soon employed first as a flora writer and then as an editor with ABRS. One of her initial roles was to write accounts for 'orphan' families without active experts or researchers. Helen's combined contributions to the *Flora* are both enormous and diverse—she worked as a writer and editor on more than 25 plant families in nine volumes of the *Flora*,

and produced accurate and detailed scientific illustrations for many of these (Fig. 2 is a fine example). Her outstanding contribution was recognised in Volume 28, which was dedicated to her in 1996, at the end of her ABRS career.

Helen's role as a flora-writer proved both rewarding and frustrating: rewarding and stimulating because it involved study of a wide range of diverse taxa and often led fairly quickly to publication, and frustrating because it tended to throw up problems that would have been interesting to pursue but could not be tackled in the time available. However, she did find time for research, and is responsible for one new family, two new genera, 54 new species and seven new infraspecific taxa.



Fig. 1.

Ph. Australian Biological Resources Study

Four Australian plants honour the life and work of Helen Hewson:

Jungermannia hewsoniae Amakawa & Grolle, *J.*

Hattori Bot. Lab. **21**: 108 (1968).

Plagiochila hewsoniana Inoue & Grolle, *J. Hattori Bot. Lab.* **36**: 494 (1972).

Fossombronia hewsoniae G.A.M.Scott & D.C.Pike, *J. Hattori Bot. Lab.* **62**: 375 (1987), as *F. hewsonii*.

Cassinia hewsoniae Orchard, *Australian Systematic Botany* **17**(6): 511-516 (2004)

Helen and Alex George developed and updated most of the documentation surrounding the *Flora of Australia*. Her input to the *Flora's Guide for Contributors* and the *Guide for Illustrators* was substantial, especially for illustrators. The unique and innovative *Plant Indumentum Handbook* was another very useful contribution, providing a practical guide in a field of diverse opinions; ABRS still gets many requests for this internationally recognised little book.

Helen became Director, Flora, at ABRS in 1991, a position she held until 1995, when she became Director, Botany, at the Australian National Botanic Gardens and Deputy Director of the Centre for Plant Biodiversity Research. While in the CPBR Helen played a strong mentoring role, particularly with students and early career botanists and technical officers, using the opportunity to infuse her enthusiasm for genetics and other scientific interests and to influence the overall systematics agenda. Helen retired in July 1997, but continue to work on her botanical and botanical art interests at the CPBR.

In parallel with her botanical career, known to us all, Helen pursued a second passion: dogs. With her husband Leon Freund she first became interested in Australian Cattle Dogs, but after Leon's death in 1975 she concentrated on breeding and exhibiting Hungarian Pulis. Helen gained her Working Dog Licence and became a respected national judge.

Helen went on to gain a Dog Judging Diploma with the Canine Studies Institute, UK, which led

to her setting up Canine Evaluators of Australasia to run Canine Studies Institute correspondence courses under licence in the Australasian region. She applied her training and knowledge of general plant genetics to dogs, and her writing and



Fig. 2. Left: Helen Hewson's painting of *Bossiaea walkeri*.
Ph. Australian Biological Resources Study (painting and portrait).



lecturing on canine genetics and dog breeding represent a major contribution in this field. Her writing skills won her a Pal Pulitzer Award for dog writing (see Web ref. 1 for a more complete version of this part of Helen's story).

Helen's enthusiasm for the work of botany extended to legendary parties held by ABRS to celebrate each published volume of the *Flora* where representatives of the families treated in the *Flora* volume featured in the celebratory cuisine. She hosted the parties for volumes 8 and 49

at her home in Gunning and was always in the thick of contributing goodies and a helping hand (Fig. 3).

Helen had a long and illustrious association with the Australian Systematic Botany Society, serving as Editor of the Newsletter during 1986 and 1987 (Nos. 46 to 53), and was Convener of the Canberra chapter of ASBS from 1981 to 1985, and during 1990-91. This is just one example of her engagement with the politics and agenda

setting of taxonomy in Australia: she was a tireless lobbyist for taxonomy and systematics, always seeking ways to boost training, opportunities and recognition of taxonomy as a basic underpinning of Australian biological science. Helen was an early driving force in the moves that led to the establishment of the Hansjörg Eichler Scientific Research Fund which has supported a number of promising students and early career botanists.

In retirement, Helen continued working tirelessly on her botanical and canine passions, as well as an increasing third interest, botanical art and illustration. She had always produced her own scientific botanical illustrations, using pen and ink, but now she had the 'leisure' to develop her skills and interest as a watercolour artist, painting the plants she loved, and exhibiting successfully in shows. As in everything she did, Helen threw herself into her art education, taking courses with a range of prominent local artists, and a Botanical Master Class in Sydney, in 1998. Her work was hung in a number of galleries in Canberra, particularly in association with Wildlife and Botanical Artist Association exhibitions, and several of her works are now treasured possessions of her botanical colleagues. Helen was a regular winner at wildlife and botanical art exhibitions. In recognition of her contributions as a mentor in the scientific aspects of botanical art, the Wildlife and Botanical Artists group in Canberra established a prize in her honour - the *Dr. Helen Hewson Award for Traditional Botanical Art*, which was awarded for the first time in September 2007.

Helen's active retirement provided the opportunity to write the landmark book *Australia – 300 years of Botanical Illustration*. It is an erudite and beautifully illustrated account of the history and science of plant illustration in Australia and the development of botany as a science both globally and in Australia. Helen was a champion of botanical artists, past and present, and was instrumental, *inter alia*, in promoting the work of the 19th Century Australian woman artist Ellis Rowan, and drawing attention to a number of other previously underacknowledged illustrators of Australian plants. In 1982 she provided notes on the flower subjects of Rowan's paintings in the book *Flower Paintings of Ellis Rowan*, and in 1992 to 1993 delivered a series of lectures, at the National Library and elsewhere, on Ellis Rowan's paintings.

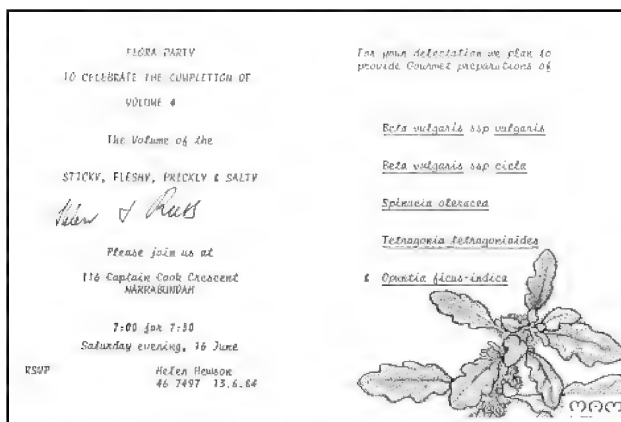


Fig. 3. Helen and Russ's invitation to the party held at Ian Telford's house celebrating the publication of volume 4 of the Flora of Australia series.

Australian Biological Resources Study

Helen inspired and motivated several generations of professional and enthusiasts in three separate fields of biological and historical endeavour; each group was amazed to discover the complete range of her activities and the energy she generated.

Helen applied her innate passion, energy, rigour, depth of research and love of historical connection to yet another project, an exhaustive family history which she continue to compile and edit until the very end.

Helen is survived by her partner of many years, Russ Kennedy, and her two brothers Bill and John.

Helen has left lasting legacies on many fronts, and her impact will be felt well into the future by her friends, colleagues and future generations of taxonomists, systematists and botanical illustrators.

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Annette Wilson
Judy West

Joseph Wiakabu, Papuan New Guinean plant collector

Mr Joseph Wiakabu was a field assistant of the Papua New Guinea National Herbarium (LAE) who made a significant contribution to botanical knowledge of his country through his plant collections and participation in botanical activities. He joined the LAE staff in 1975 and retired in 2006. From the start he proved himself a loyal worker who quietly, cheerfully and effectively participated in the herbarium routine.

Joe had a rapid introduction to botanical field work on a large scale. During the Star Mountains expedition of early 1975 he and the experienced Artis Vinas were entrusted with collecting much of the mid montane forest around the Busilmin base camp at around 1500 metres altitude. It proved a productive team, realising well-documented collections from a region previously never botanised.

Fig. (Left) Joe Wiakabu in 2005 or 2006 at the Forest Research Institute Nursery, Lae. (Ph. Barry Conn).

(Mid & right) In 1975 in front of PNG National Herbarium, Lae. (Photos: Bill Barker).

(Mid) Some of road party leaving for Mt Hagen to begin the Star Mountains expedition: front, Artis Vinas, Joe Wiakabu; rear, Government truck driver, Yakas Lelean, Jim Croft, Bill Barker, Beong (driver), Thomas Umba (absent: Dries Touw and Jef Veldkamp, Leiden).

(Right) Part of a staff photo on day of Papua New Guinea's independence: anticlockwise from front left, Joe Wiakabu, Yakas Lelean, Anderson Moneo, Barry Conn and Bill Barker.



Joe's legacy of plant collections includes:

April–May 1975: Star Mountains (West Sepik) with N.A. (Artis) Vinas;
March 1977: Itikunumu and near Owens Corner (Central) with Micky Benjamin (the first and only female Papua New Guinean botanist employed at LAE);
June 1977: Yano Logging Area and from near Kupiono (Central);
December 1977: Markham Bridge (Morobe);
July 1978: Daru (Western province);
January 1979: Lae Botanic Gardens (Morobe);
May 1980: Baiyer River Sanctuary (Western Highlands);
June 1980: Divide between Jimmi and Trauna Valley (Western Highlands);
July 1980: Lae Botanic Gardens (Morobe);
1981: Mt Karoma (Southern Highlands) with J-F. Veldkamp;
January 1982: Lae Botanic Gardens (Morobe);

August 1999: Josephstaal Forest Management Area (Madang) with W. Takeuchi;

July 2003 Lae Botanic Gardens (Morobe) with D. Crayn, R. Banka and E. Sape.

Joe was admitted to the Wewak hospital on the 27th November 2007 and discharged on the 4th December. He was later re-admitted to Dagau Health Centre and again discharged on the 10th December. He died from a hepatoma the next day, 11th December 2007, at his village, Magued in Daguain (East Sepik).

A quiet gentle person, Joe will be sadly missed

Barry Conn
New South Wales National Herbarium

W.R. (Bill) Barker
State Herbarium of South Australia.

News

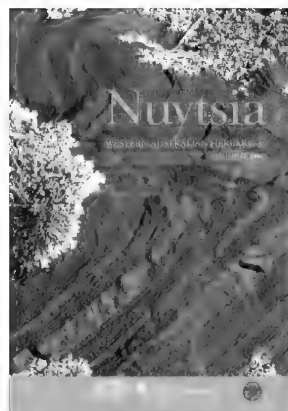
Special edition of *Nuytsia* launched

The 'Saving our Species' special edition of *Nuytsia* (Volume 17) is the result of a year long project which aimed to resolve the taxonomy and expedite the scientific description of unnamed vascular plant taxa in Western Australia. The focus of this issue was to describe species endemic to, or with distributions centred on, the Banded Iron Formation (BIF) ranges of the Yilgarn Craton, and the Ravensthorpe Range and Bandalup Hill, due their significant biodiversity values and current mineral prospectivity. In addition to describing species that may be impacted by mining activities, the project also targeted rare or poorly known taxa from across the State.

The special issue was launched on 5th December by The Hon. David Templeman, Western Australia's Minister for the Environment and Climate Change (Fig. 1), in front of a sizeable gathering of interested parties. In an eloquent introductory speech, David Coates (DEC) marvelled at the size of the special edition, commenting that the 45 papers in which 95 new taxa are described far exceeded initial

expectations of the project. He acknowledged that such a significant outcome was made possible not only by the provision of appropriate resources, but through the collective effort of numerous local and interstate research scientists.

Fig. 1. (Below). At the launch of volume 17 of *Nuytsia*: (left to right) Terry Macfarlane, Ryonen Butcher, Kelly Shepherd, David Templeman, Juliet Wege and David Coates. (Right). Front cover of *Nuytsia* volume 17..



He emphasised the important role of taxonomic research in conserving the State's biodiversity, drawing attention to the sobering fact that 76 of the taxa newly described in the edition are listed as Declared Rare or Priority Flora. Geoff Cockerton (Landcare Services Pty Ltd), in his typically flamboyant style, later spoke passionately on the importance of accessible taxonomic information to the botanical consulting industry, and highlighted the great satisfaction of seeing taxa that Landcare Services staff had proposed as potentially new, being named and described in the special issue.

It is of special note that 17 taxa with distributions centred on the BIF ranges of the Yilgarn Craton are formally described in the special edition. Their publication follows the recent release of the strategic review of the Banded Iron Formation ranges of the Midwest and Goldfields (Web ref.).

The support for this project has been wonderful and once again we thank the 73 authors and reviewers, along with DEC staff members and the botanical consultant community, for their valued contribution. It is hoped that this taxonomic momentum can be carried forward and as such we are keen to continue liaising with botanists from around the country. With a known taxonomic backlog of some 1500 taxa, and with new species continuing to be uncovered during botanical surveys and through ongoing assessment of the State's herbarium collection, the task ahead remains daunting. Future special issues addressing some of this backlog remain a possibility but are dependent, in part, on the availability of future funding.

Web ref. <https://www.naturebase.net/content/view/109/97/>.

Juliet A. Wege, Kelly A. Shepherd
and Ryonen Butcher
Western Australian Herbarium

An exciting year for the WA Herbarium

2007 was an exciting and demanding year for PERTH; 2008's looking good too, and 2009 is definitely shaping up to be a gold-star event.

The most significant event for the long run was the final approval in mid-2007, and beginning of construction a few months later, of the Department of Environment and Conservation's new Biodiversity Science Centre (Fig. 1). The BSC is a Herbarium-plus – it will bring together and integrate the Herbarium, the Threatened Seed Centre, and a number of groups from DEC's Science Division, notably those of the Director and the conservation and population genetics groups of Dave Coates and Margaret Byrnes.

The 3-story building adjacent to the Kensington offices of DEC will be centered around an atrium providing lighting, airflow, open space including exhibition space, and public areas including a cafeteria. The Herbarium areas will mostly occupy one side of the building, with the combined DEC Science Libraries, genetics and conservation biology labs and meeting rooms occupying the other side.

Fig. 1. (From top left, anticlockwise). a, Biodiversity Science Centre construction work, 25th Jan 2008; b, staff visit that day; c, Biodiversity Science Centre north elevation and d, west elevation.
Ph. K. Thiele



Insect control in the Herbarium vaults will be through climate control, with the vaults to be kept at 17°C and 50% RH. This has required substantial rethinking of specimen flows in the building. For example, since the intention is to discontinue fumigations, all specimens in taxonomists' offices and in the curation workrooms will need to be kept in mobile trolley-stacks so that they can be rotated frequently through the freezer-rooms. I'm thinking of a scene once a month like the supermarket one in *Stepford Wives* where a bell rings and all the taxonomist's doors open and we all emerge to push our trolleys down a long corridor into the freezer.

Fire suppression in the new building will be by water misting rather than gas; accordingly, specimens will be housed in plastic boxes similar to the BRI boxes, in fixed racking. We are looking into a slight modification to the BRI boxes to make the top hinge more waterproof.

The collections will be reorganized along the lines of APGII or a modified APGII order. We settled on this after long discussions and consideration of many options ranging from the sublime to the ridiculous. What we'd really like is a fully robotic herbarium where the collections are stored in sealed vaults arranged by PERTH number, with computer-controlled delivery via chutes to all the offices. Maybe next time.

As I'm sure everyone who has been involved in designing and moving a herbarium will be aware, the last several years has seen a seemingly endless series of meetings to plan the building and the move. We are currently experiencing a bit

of a lull before the storm, which will break when the building is finished in mid-2009.

There will be big benefits to offset the pain, including better integration between the Herbarium and other parts of DEC Science, the long-sought integration of the collections (we'll finally be able to get rid of the stacked cardboard boxes on top of the compactuses), more space and better facilities, a new building that doesn't require endless and expensive upkeep, and an opportunity to audit the entire collection during the move and hopefully be able to relocate those long-lost, misfiled specimens.

We will be requesting the recall of loans from other institutions to make the move more effective, and will make every attempt to return all long-outstanding loans from PERTH to reduce the number of specimens we need to handle. Please note that there will be a period in late 2008 and early 2009 when PERTH will be closed for business while the move happens.

Kevin Thiele

Australasian electronic Floras workshop in Adelaide

"Towards a common approach to Australasian electronic Floras" was the theme of a workshop held under the sponsorship of CHAH at the State Herbarium of South Australia on 3–4 October 2007. New Zealand, the Commonwealth and all but one of the States and Territories were represented (Fig. 1), a measure of the scale of interest with only two months' notice given of the event.

Fig. Electronic Floras meeting Adelaide. From left, Jim Croft and Greg Whitbread (CANB), Helen Thompson (ABRS), Robyn Barker and Rex Croft (AD), Marco Duretto (HO), Juergen Kellermann (AD), Murray Henwood (SYD), Karen Wilson (NSW), Dale Dixon (DNA), Laurence Payne (HO), Jerry Cooper (CHR), Hellmut Toelken (AD), Brett Summerell (NSW), Kevin Thiele (PERTH), Isle Breitwieser (CHR), Neville Walsh and Peter Neish (MEL), Peter Thornton (AD), Belinda Pellow (Uni Wollongong). Ph.



Subjects covered included:

- Current and planned involvement in eFloras by each organization. There are four current state floras on line as well as the Flora of the Sydney region and Flora of Australia. Recent proposals for an alliance in production of algal floras of Western Australia and southern Australia able to be integrated under the Australian Marine Flora On-line banner (ABRS, PERTH, AD) exactly fits the model aspired to by this meeting – distributed data sets servicing both state and regional jurisdictions as well as an integrated broader (ultimately national) view.
- The level of “atomization” of descriptive data. It was agreed that we should be not break plant descriptions down to the level of character (e.g. flowers) and state (e.g. white), but to confine ourselves to delivering an overall description.
- Current drives globally to develop data standards for descriptive data. It eventuated these were still inadequately advanced but there were “schema” (logical data hierarchies) into which to build our own agreed standard. The meeting developed an agreed set of descriptive data fields which are to be expressed in an agreed schema chosen from amongst several that are being developed globally.
- Options for mechanisms for editors and authors to maintain and update descriptive and image data. It was considered that most currently on-line had deficiencies, but that there were some achievable ways to deliver this needed functionality.
- Agreement on data integration standards. Those from this alliance should be compatible with the developing global standards. As potentially one of the first such working standards (it is proposed to use it in the current Flora of South Australia project for example and the algal flora projects described above) it would undoubtedly have influence on these other standards.

Documentation was compiled before and during the meeting on a HISCOM wiki (Web ref. 1) and will continue to be updated.

Web ref. 1. http://hiscom.chah.org.au/wiki/index.php/HISCOM/CHAH_Workshop.

Bill Barker

New Keeper of the Herbarium, Library, Art and Archives at Kew

Eminent botanist, historian and botanical art enthusiast Professor David Mabberley has been appointed as Keeper of the Herbarium Library, Art and Archives at RBG, Kew. Professor Mabberley holds the endowed Orin & Althea Soest Chair in Horticultural Science and is Director of the University of Washington Botanic Gardens, which includes the Washington Park Arboretum, the UW Center for Urban Horticulture, the Elisabeth

C. Miller Library, the Otis Douglas Hyde Herbarium, and the Union Bay Natural Area. He is also Extraordinary Professor at the National Herbarium Nederland, Leiden and Adjunct Professor, University of Western Sydney. He has been President of the International Association of Plant Taxonomy since 2005.

Prior to his present post, Professor Mabberley has had a distinguished botanical career in academia, and as Chief Executive Officer of Greening Australia NSW, a revegetation non-government organisation in trouble that was rejuvenated to one with a bright future under Professor Mabberley's leadership.

Professor Mabberley is perhaps best known for his widely used *The Plant Book*, providing a generic overview of the world's flora, currently being revised for a third edition. He has authored 15 other books, including the definitive biography of Robert Brown, as well as books on skilled botanical artists including Ferdinand Bauer and Geraldine King Tam. He is widely published in the scientific literature, and received the Linnean Gold Medal for Botany in 2006.

He will commence duties at Kew in March 2008.

Steve Hopper, Director, Kew

Peter Neish moving on from the National Herbarium of Victoria

MEL's IT guru over the past decade has moved in January 2008 to a position managing the information systems at the Parliament of Victoria library. Members of the IT committee HISCOM advising CHAH will be particularly saddened as Peter provided much support to national projects such as the Australia's Virtual Herbarium and international projects such as the transformation of Australia's data transfer standard HISPID into a data dictionary for the global transfer standard ABCD.

Jane Morton moving on from Weed Spotting

After three and half years with the Weeds CRC the time has come for me to move on to another role – my last day is the 11th January 2008. I have accepted a position as Project Manager with the Invasive Plants and Animals Unit of Biosecurity Queensland in the Qld Department of Primary Industries and Fisheries. My role will be to further develop the National Weed Incursion Response Plan as part of the Defeating the Weed Menace Program. It will be an exciting job, as the plan includes support for a national community based surveillance network.

Weed Spotters will continue to run in Queensland until June 2008 and may well extend past that end date.

Jane Morton, Queensland Herbarium

Review of CRC programme

Senator Kim Carr, Minister for Innovation, Industry, Science and Research, has announced a review of the Cooperative Research Centres (CRC) Program as part of a broader review of the national innovation system.

The review aims to identify areas to further promote and encourage investment and collaboration between research and industry. It will examine the overall strategic direction of CRC's, looking at the full range of issues, including governance and program design issues, the level and length of funding needed to support the program's objectives, as well as its overall scope and effectiveness. There is also an intention to restore public benefit as one of the primary objectives of the CRC Program and this principle will apply again from the next funding round.

The next CRC selection round will be held once the Government has considered the outcomes of the Review of the National Innovation System; the present aim is to have the next selection process completed by the middle of 2009.

The CRC Program review will be chaired by Professor Mary O'Kane. For more information

on the wider Review of the National Innovation System and the CRC Program review, see <http://minister.innovation.gov.au>

Some old news: Churchill Fellowship for Ray Cranfield ...

Ray Cranfield of the Western Australian Herbarium was awarded a Churchill scholarship in 2007 to study historical lichen collections and community participation in lichen surveys and collections in the UK and Sweden.

Applications for this year's Churchill scholarships close on 29th February 2008.

Web ref. www.churchilltrust.com.au/index.php

... and the Jim Ross PhD Scholarship

To go with the ASBS *Pauline Ladiges Prize* (see president's report) and the National Herbarium of Victoria's *Jim Willis Fellowship* there is also the National Herbarium's Ph.D. scholarship, first introduced as a Cybec scholarship in 2004, but renamed the *Jim Ross Scholarship* in 2006.

Web ref. www.cybec.com.au/RMBG.htm#CybecPhD

Food for thought

Fossil orchid and pollinator provide date of origin for orchids

A preserved orchid pollinarium attached to the mesoscutellum of an extinct stingless bee has been recovered from Miocene amber in the Dominican Republic. This find represents the first unambiguous fossil of Orchidaceae as well as a fossil observation of a plant–pollinator interaction. Along with other fossils of known date, its age has been used to calibrate a molecular phylogenetic tree of the Orchidaceae. This indicates that the most recent common ancestor of extant orchids lived in the Late Cretaceous (76–84 Myr ago).

Reference

Ramírez, SR Gravendeel, B, Singer, RB Marshall, CR & Pierce, NE (2007). Dating the origin of the Orchidaceae from a fossil orchid with its pollinator. *Nature* 448, 1042–1045.

European Potato origin: Andean or Chilean, or both?

Whether the European potato was of Chilean (lowland) or Andean (upland) origin has long been debated. Most sources decided on an Andean origin even though most current European potatoes also show some Chilean traits - the explanation for the latter being a supposition that

Chilean potatoes were used for crossing purposes after the Irish potato famine in the 1840s.

First records of the potato in Europe were from the Canary Islands in 1567 and molecular studies have now shown that this earliest known landrace of the European potato, still believed to persist in the Canary Islands, are of mixed Andean and Chilean origin

The authors of this study now plan further investigations on the origin of the European potato by using DNA extracted from herbarium specimens of cultivated potatoes collected in Europe before 1845.

Reference

Ríos, D., Ghislain, M., Rodríguez, F. & Spooner, D.M. (2007). What Is the Origin of the European Potato? Evidence from Canary Island Landraces. *Crop Science* 47: 1271–1280. <http://crop.scijournals.org/cgi/content/abstract/47/3/1271>

The “Botanist effect”

An initial paper by Moerman & Estabrook (2006) suggested that North American botanical diversity increased with the presence of botanists and universities, a phenomenon they called the ‘botanist effect’. Pautasso & McKinney (2007) have revisited this premise and shown that “plant

species richness increased with human population size and density in counties with and without universities and/or botanical gardens” and so the botanist effect seems to have been rather short-lived.

Reference

Moerman, DE & Estabrook, GF (2006). The botanist effect: counties with maximal species richness tend to be home to universities and botanists. *Journal of Biogeography* 33 (11): 1969–1974.

Pautasso, M & McKinney, ML (2007). The Botanist Effect Revisited: Plant Species Richness, County Area, and Human Population Size in the United States. *Conservation Biology* 21(5): 1333–1340.

Use of natural history specimens in population genetics

The authors of this article provide a good summary of global studies already undertaken using natural

history collections as a source for documenting evolutionary change. They also propose a set of guidelines for the use of such material, propose the adoption of a sceptical attitude towards the results obtained and comment on the lack of plant and invertebrate studies compared with those for vertebrates.

Reference

Wandeler, P Hoeck, PEA & Keller, LF (2007). Back to the future: museum specimens in population genetics. *Trends in ecology and evolution* 22(12): 634–642.

Playing taxonomist

Some of you will have already seen this courtesy of Stephen van Leeuwen – the description of a whole new and previously unconsidered plant family

Web ref. www.ethnobotanyjournal.org/vol5/11547-3465-05-159.pdf

Miscellanea

Some background to Robert Brown's Australian botanical work: his manuscripts, publications and plant-names

Major studies of Robert Brown's Australian work have so far been largely related to a biography (Mabberley, 1985), a listing of his zoological manuscripts at the present-day Natural History Museum (Wheeler, 1993) and the publication of a catalogue of Brown's botanical manuscripts (Moore & Beasley, 1997) also at the Museum. Major works continued with the publication of his Australian diary (Vallance *et al.*, 2001) made on the *Investigator* voyage (1801–05).

We believe that the next logical step is a catalogue of his plant-names most of which appeared in his *Prodromus* (Brown, 1810). We have therefore started to prepare a catalogue setting out the names with their types and current disposition. In addition, we are listings Brown's botanical manuscripts at the Natural History Museum and the British Library, both institutions derived from the original British Museum, where Brown was first Keeper of the Banksian Botanical Department, as well as those manuscripts at the Linnean Society of London.

The overwhelming majority of Brown's (1810) *Prodromus* names refer to Australian plants. However, Brown's work covered plants from many parts of the world, particularly South Africa but also northern and eastern Africa and the Canadian Arctic with a small number from South America, mostly leading to descriptions of specimens in Sir Joseph Banks's herbarium (now at BM).

The plant groups tackled so far include the pteridophytes, the restios, the grasses, sedges and the rushes as well as Proteaceae and Apocynaceae (*sensu lato*), both plant groups in which Brown had a particular interest. Work on the Compositae, which was to have appeared in Brown's unpublished second volume of the *Prodromus*, has also reached an advanced stage.

References

Brown, R. (1810). *Prodromus Florae Novae Hollandiae et Insulae Van-Diemen* ... London.

Mabberley, D.J. (1985). *Jupiter Botanicus: Robert Brown of the British Museum*. J. Cramer and the British Museum (Natural History), Braunschweig & London.

Moore, D.T. and Beasley, M.A. (1997). The botanical manuscripts of Robert Brown. *Archives of Natural History* 24: 237–280.

Vallance, T.G., Moore, D.T. and Groves, E.W. (2001). *Nature's Investigator: The diary of Robert Brown in Australia, 1801–1805*. Australian Biological Resources Study, Canberra.

Wheeler, A. (1993). The zoological manuscripts of Robert Brown. *Archives of Natural History* 20: 417–424.

D.J. Mabberley and D.T. Moore

Western Australia plant knowledge advancing apace

As well as the approval for the new WA Herbarium building, 2007 was a record-breaking year in another sense. During the twelve calendar months of 2007, 302 new taxa of WA plants, algae, lichens and fungi were described and added to the WA Census. The great majority of these were flowering plants, and this represents the largest yearly addition of *de novo* flowering plant taxa to the State's flora since 1810 when Robert Brown published the *Prodromus* and

described 497 new WA taxa (of course, new taxa were a dime a dozen in 1810).

Other peaks in the description of new taxa occurred in the mid-nineteenth Century with the publication of Bentham's *Flora australiensis* (maximum 185 taxa/year), in 1904–5 with Diel's & Pritzel's *Fragmenta* (159 taxa in 1904) and in the mid-1990's at the height of *Flora of Australia* activity (279 taxa in 1995).

The record number came about through a confluence of a number of substantial works boosting a high background level of activity. Significant publications were the *Eremophila* book by Bob Chinnock, the *Jacksonia* revision by Jenny Chappill and the *Nuytsia* special edition which saw the description of 95 new taxa, many from Banded Ironstone and related ranges. All these were the result of significant work by the entire Australian botanical community.

The species accumulation curve in Western Australia continues to head upwards with no plateau in sight - clearly, there are a whole lot more taxa still undescribed. Two challenges are to continue with a high level of alpha-taxonomic activity in the State, and to convince the higher powers that, while *anni mirabiles* are not possible every year, with sufficient funding substantial taxonomic gains are possible.

Kevin Thiele, WA Herbarium

Georgiana Molloy

Juergen Kellermann drew attention to a program on ABC Radio National about Georgiana Molloy, her life, her botanical collections and the letters she wrote from W.A. in the 1830s and 1840s. The programme can be downloaded from the "Hindsight" web-site.

Web ref. www.abc.net.au/rn/hindsight/stories/2008/2/111669.htm

Accessing FI Types

In view of the fact that the herbarium of Museo di Storia Naturale dell'Università, Florence (FI) do not normally lend specimens it might be of interest to others that Paul Forster reports being successful in obtaining images of types from there. Paul requested information through the Florence website about the existence of particular types and though there was no electronic response he did receive a covering letter and excellent jpeg images on CD of these types.

Web ref. www.aluka.org/page/about/partners/italy_fi.jsp

National Taxonomy Forum

Taxonomists as an endangered species got a run in the National Press as a result of the National Taxonomy Forum held on 4–5th October, 2007 at the Sydney Museum (Web ref. 1). But why is it only ever the Higher Education Supplement of *The Australian* that picks up on this, despite there no doubt being every effort to attract media attention? The Forum is referred to in some more detail in the ABRS Report.

Web ref. 1: www.theaustralian.news.com.au/story/0,25197,22521012-12332,00.html

View the completed Australian Tropical Herbarium, Cairns

For those of you who walked over the site at the Cairns ASBS meeting in 2006 a photo of the completed building can be seen in a downloadable information kit.

Web ref. www.anbg.gov.au/cpbr/cairns/cairns-herb-07-12.pdf

ABRS report

We were deeply distressed and saddened by the sudden death of **Lyn Jessup** on October 25, 2007. Lyn moved from Brisbane, and a job with the University of Queensland, to join us as Assistant Editor. She was with us just over 2 years, and made an enormous contribution in her time with ABRS, working on everything from the *Algae of Australia* to our newsletter *Biologue* and our web pages.

Lyn made particularly telling contributions to the four volumes of the *Algae of Australia* published in 2006/07. Her efforts ranged from editing and formatting of text and images to proof-reading and compiling and checking indices. She took a leading role in the editing and publication of Glenn McGregor's *Freshwater Cyanoprokaryota*

of North-Eastern Australia 1: *Oscillatoriales* which appeared in May 2007.

Her plans for the re-vitalisation of the ABRS web site held great promise, while her key contribution to the re-design and expansion of the previously rather staid *Checklist of the Lichens of Australia and its Island Territories* saw the addition of keys, species descriptions and hundreds of images. Throughout these and all other activities at ABRS she remained enthusiastic, invariably helpful, and full of bright but achievable ideas. She is greatly missed.

We also mourn the death of **Helen Hewson**, whose obituary appears elsewhere in this newsletter. Helen worked with ABRS for more than 20 years and was an inspiration to all of us. Her laughter will echo here for many years to come.



Fig 1. Delegates at the National Taxonomy Forum at the Australian Museum, Sydney on 4–5 October 2007. Ph. Bill Barker

National Taxonomy Forum – Sydney October 2007

The National Taxonomy Forum was held on 4–5 October 2007 at the Australian Museum, NSW, with the kind support of the Museum and the Federation of Australian Science and Technological Societies (FASTS) (Fig. 1). Key themes to the Forum were research priorities and gaps, resourcing for taxonomy and the needs of the wider user community. Six keynote speakers addressed the gathering before people divided into five workshop groups to discuss some of the challenges facing taxonomy and taxonomists today. The results will be edited by FASTS and co-published by ABRS and FASTS in early 2008 as the first step in developing a national strategy for taxonomy. In the meantime the programme, powerpoint presentations of the keynote speakers, and introductions to the workshop sessions are available on-line (Web ref. 1).

Staffing

Robyn Lawence, our database and IT manager, is taking a year off in 2008, to pursue her studies. We are currently recruiting a temporary replacement.

Atlas of Living Australia

ABRS, as part of the Department of Environment and Water Resources, has signed up as a 'participant' in the Atlas of Living Australia, along with CSIRO, Australian Museum, CHAH, DAFF, Museum Victoria, Queensland Museum, Southern Cross University, Tasmanian Museum and Art Gallery, and The University of Adelaide. Cameron Slatyer is a member of the ALA Management Committee.

Recent Publications

Biologue

ABRS's annual newsletter, *Biologue*, previously published and distributed around October each year, has ceased as a paper publication and is

now available online (Web ref. 2). The decision to move *Biologue* entirely online has not been made lightly, but preparing, designing, printing and distributing it absorbed significant resources at ABRS, which can be better directed to our editing and publishing programmes.

You can now find *Biologue* at:

Algae of Australia: Marine Benthic Algae of Lord Howe Island and the Southern Great Barrier Reef, 1. Green Algae (G.T.Kraft).

This volume includes 7 orders, 18 families, 41 genera and 135 species and infraspecific taxa of benthic green algae. Richly illustrated with photographs, many of them in colour, the volume includes an introduction to the islands, identification keys to genera and species and a comprehensive description and discussion of each taxon. The genus *Botryodesmis* (Udoteaceae) is newly described, as are species of *Boergesenia*, *Botryodesmis*, *Bryopsis*, *Cladophoropsis*, *Codium*, *Halimeda*, *Pseudochlorodesmis*, *Ulva* and *Ulvella*. Available from CSIRO Publishing for \$125 + postage.

Forthcoming Publication

Fungi of Australia: The Smut Fungi (Kálmán Vánky & Roger G. Shivas)

This volume of the *Fungi of Australia*, the first overview of the Australian smut fungi in almost 100 years, includes identification keys to genera and species, full synonymy, descriptions and comprehensive lists of specimens. The accompanying CD (by Roger Shivas, Dean Beasley and Kálmán Vánky), incorporating a Lucid™ Player, provides an easy-to-use, interactive key to smut species, with comprehensive fact-sheets, distribution maps, and over 1,000 images. This will be available from CSIRO Publishing, price still to be determined

Web ref. 1. www.environment.gov.au/biodiversity/abrs/ntf.html

Web ref. 2. www.environment.gov.au/biodiversity/abrs/biologue/index.html

Annette Wilson, Patrick McCarthy

ABLO report

I am pleased to be here at K as the 52nd ABLO. The move into the position was made much easier in particular due to the prior advice from and induction by my immediate predecessor, Jenny Tonkin. Best advice: set up an English bank account while still in Australia. Although I had visited Herbarium K four times previously, the role of ABLO presents many tasks that have been much easier to deal with due to the two days Jenny spent introducing me to the job. Jenny also kindly and thoughtfully facilitated our immediate move into the flat we rented right next to Kew Gardens (the same flat that many, but not all ABLOs have rented over the years; yes Grace and Nigel still next door and Olive upstairs; currently with major hot water upgrading going on).

I would like to thank those who helped me get here (ABRS, CHAH, K colleagues, and UNE). Special thanks go to Dr David Backhouse for taking on much of my teaching for 2007–2008 (Biology II; and Plant Diversity). Dr Glenda Vaughton (Evolution and Biogeography), and many colleagues at the Australian Museum and Botanic Gardens Trust Sydney (Biological Systematics) thanks for dealing with the rest of my teaching load. Associate Professor Caroline Gross (then Head of School) along with Prof. Margaret Sedgley (Dean/PV-C) and Prof. David Rich (as Acting V-C) all strongly supported my application for Study Leave from UNE. Perhaps this gives you some insight as to why I am the first university systematist to be ABLO. Let's hope others will be able to get similar support.

Visitors hosted or facilitated by ABLO

There have been a few Australian visitors during my first three months here. I joined a VIP group from Western Australia (Hon David Templeman MLA, Minister for the Environment; Climate Change; Peel; Stephen Dawson, Chief of Staff to the Minister for the Environment; Climate Change; Peel; and Keiran McNamara, Director General, Department of Environment and Conservation) for their visit to the Millennium Seed Bank at Kew's Wakehurst Place (Fig. 1) (reported in Kew's internal magazine, *Vista*). Ms Bronwyn Collins (CANB), Mr Nick Cuff (BRI) and Ms Sabine Glissmann-Gough (MEL) each toured the herbarium and gardens. Dr Ian Scales (ANU, RSPAS) and Mr David and Mrs Lynn Blackwood of Tasmania each had more extended visits to K. Drs Molly Whalen and Duncan Mackay (Flinders Uni) are current visitors.

Requests

There has been a steady stream of requests by email for images of and/or observations on specimens, and for hard to procure literature.

I will give stats on these and other aspects in a half-yearly report. For both I am dealing with the requests in the following ways. For literature, I am photographing the article or item within the UK copyright restriction of no more than 5% of total or one paper/chapter; whichever is less, and within the restrictions of the institution, e.g. at K this means no flash and filling out a detailed request to photograph the item. For herbarium sheets, I seek permission to extract the sheets and photograph them from the relevant section head. I photograph the sheets with scale bar. Once I have taken images of the literature or specimens I download them to my computer, and orientate the images in Picasa, sometimes cropping or otherwise post-processing the images, and I use



Fig. 1. Hon David Templeman MLA, Minister for the Environment; Climate Change; Peel; Stephen Dawson, Chief of Staff to the Minister for the Environment; Climate Change; Peel; and Keiran McNamara, Director General, Department of Environment and Conservation) at Kew's Millennium Seed Bank. Ph. J. Bruhl

this program to upload the images to a Picasa Web Album, to a private location only visible to those with the specific address. I then email the requestor, giving them the address and reminding them that the images are only for their private research, and that permission to reproduce the images must be obtained from K. Although the images I take of specimens are probably, in most cases, of publication quality, they certainly are not of the same quality provided by the scanning equipment in Kew's digitising suite. If that higher quality is needed, I will scan and database the specimens (though that is a much slower and more onerous process). I have been able to deal with specimens and literature this way at all the herbaria I have been working in. Meanwhile, the feedback I have had indicates that the recipients are very happy with the approach.

Replicates at K assigned to Australian herbaria

Jenny Tonkin has previously reported on various difficulties at K in dealing with the AQIS

requirements for herbarium specimens going to Australia. With clarification from Dr Brett Summerell (Chair of CHAH), and discussions with staff of Kew's "Collections Management Unit" (CMU), I was able to determine that the main impediment was the requirement for a 'detailed' listing of each specimen for each shipment to allow K to ensure that no 'Scheduled' species are included (these take further documentation and permission to deal with and are generally best avoided) and to allow AQIS staff to assess the contents of the shipment in light of their Act and Regulations.

Loans are not affected, as long as all the now-standard documentation/permits and labelling are in provided by the requesting Australian herbarium, as Kew produced a list of specimens going out on loan as a matter of standard practice. CMU, however, were not sending out any replicate specimens on exchange or gift to Australian Herbaria as their standard practice is not to produce such lists for exchange and gift sheets; something they were not prepared to do for Australian herbaria given that they send out tens of thousands of such specimens each year worldwide.

So, I have started taking bundles of specimens from the exchange/gift pigeon holes of Australian herbaria to my office and I simply prepare the necessary list myself. I then return the specimens with printed list back to CMU. They are happy and will send these bundles out. I have done one bundle each for both BRI and NSW and there are many specimens for CANB to do, plus others, I am sure.

Functions and events

Dr Peter J. Edwards, Kew's "Pteridophyte specialist" and member of the "Wet Tropics: SE Asia" science team, retired recently. His farewell luncheon function was on 11 Oct 2007 (Fig. 2). Peter, nevertheless, continues his studies on ferns in the herbarium. His 'farewell' was a convivial and scrumptious affair.

During October, Professor Steve Hopper, Director of the Gardens, held several well attended talks to update staff at Kew on the new strategic directions he plans to take the institution; the strategic plan has been endorsed by the RBG Trust and will be publicised sooner than later.

Those familiar with the Jodrell Laboratory (the famous anatomical and molecular laboratories at Kew) will know that Prof. Mark Chase was made Keeper of the Jodrell Laboratory in July 2006. More recently, several people were interviewed for the vacant position of Keeper of the Herbarium. Prof. David Mabberley will take up this post in March 2008. Prof. Simon Owens took up a newly created position in the executive (Head of Strategic Projects). Meanwhile the role

of Acting Keeper of the Herbarium has circulated amongst the Assistant Keepers. Dr Dave Simpson is Acting Keeper during December 2007 and January 2008.

There are many events botanical, scientific and cultural at Kew. The best way to keep up with goings on from a distance is to visit the Kew website (Web ref. 1). As you can see, we are lucky to be here during the year of the Henry Moore exhibition (Fig. 3; Web ref. 2). Of course, any visitor to the

herbarium should allow time to visit the gardens, sculptures and glasshouses. If you come during December you can also go ice skating at Kew (yes, you have to pay for that one).

Visits to herbaria, institutions, conference and fieldwork¹

In addition to K, I have visited BM several times at South Kensington. I also made a short, initial visit to P. The train trip is very efficient. I will treat that as a reconnaissance, as I have more specimens to examine there. I am grateful to Philippe Morat for facilitating my visit to P.

I visited (São Paulo Herbarium) SP for a day of Cyperaceae determinations and a walk around the botanic gardens during a week's visit to Brazil with Dave Simpson from K. We attended and



Fig. 2. Peter Edwards giving his retirement speech at Kew. Ph. J. Bruhl.

Fig. 3. Royal Botanic Gardens Kew looking through sculpture of Henry Moore.



¹ For herbarium abbreviations and web searches for Brazilian universities, see Web ref. 3

participated in the Cyperaceae Symposium of the 58th Brazilian Botanical Congress in October 2007, São Paulo, Brazil (the title of my presentation was 'Systematic studies in Schoeneae: progress, problems, and prospects'). A small band of cyperologists (Fig. 4) from USA (Eric Roalson, Washington State University; Wayt Thomas, NY; Gordon Tucker, EIU), UK/Australia (Dave and I) and Brazilian botanists (Ana Claudia Araujo, UFRGS; Ana Paula Prata, ASE; Regina Barbosa, UFPB) went to Diamantina where Fabio Vitta (a cyperologist and academic at the new Universidade Federal dos Vales do Jequitinhonha e Mucuri) took us on some great sedgey fieldwork. Many thanks go to Ana Claudia, Wayt and Fabio for their organisation of the symposium and/or fieldwork; and to Dave Simpson and K for some support to me for that trip.



Fig. 4. A break between dealing with indet. Cyperaceae at SP. From left, Raphael Trevisan (UFRGS), Eric Roalson (Washington State U), Anna Claudia Araujo (UFRGS), Gordon Tucker (EIU), Sonia Hefler, W. Wayt Thomas (NY), David Simpson (K), Jeremy Bruhl (NE)

Ph. J. Bruhl.

coating and scanning electron microscopy (SEM) of material I collected in Australia of *Lepironia articulata*, towards an understanding of its floral development. The interpretation of the floral structures in this and many other mapaniid sedges, and for Cyperaceae at large, is still a matter of contention, which I hope to resolve by my SEM studies in collaboration with Paula Rudall, Karen Wilson, Jenny Richards and Dave Simpson. Chrissie Prychid has been very helpful and shown me the ropes in the anatomical lab.

I have also enjoyed spending time working towards a more detailed molecular phylogeny of Schoeneae (Cyperaceae), extracting DNA, running PCRs, gels, and preparing samples for gene sequencing all in the one laboratory complex

Fig. 5. Top, Castle Pruhonice is the current location for staff of PR. Below, The new home of PR at Pocernice..

Ph. J. Bruhl.

I have recently returned from a week in the Czech Republic, working at the herbarium of the PR and PRA in Průhonice and the new location for PR at Horní Počernice (Fig. 5; you can spot the new buildings to house the collections of the National Museum using Google Maps; look for the pyramids – Web ref. 4) The main purpose of that trip was to examine material of Domin's Herbarium for various Australian botanists.

A castle, as at Průhonice, is an interesting venue for a herbarium! The staff of PR were most helpful and I was able to photograph various sheets, carry out determinations and make arrangements for some loans. The entire Domin herbarium, already at Horní Počernice, will eventually be imaged, at high quality, and this will be most useful for Australian botanists, given the breadth of his collections. There will still, however, be much work that needs to be done by close examination of the specimens for specific research projects. Domin's collections are fantastic; I am desperate to get to Chillagoe in a 'good year' as Domin did.

My visit to PR and PRA at Průhonice was very much and very well facilitated by Dr Ota Sida (PR) and particularly by Dr Jan Kirschner, the Director Institute of Botany, Academy of Sciences (PRA; the institution that owns the castle as Průhonice). This was a good opportunity to continue a conversation about prospective research on Juncaceae with one of the world's leading specialists of the family.

Research

I am working in both the anatomical and molecular labs of the Jodrell. I have been having fun doing my own dissections, critical point drying, platinum



(Fig. 6). This work is in collaboration with Mark Chase, Felix Forest (the Head of Molecular Systematics), and Australians including Karen Wilson, Russell Barrett and John Hodgson, with the direct help of Dave Baker and Laszlo Csiba at the Jodrell.

At K, BM, P, and PR I have been working in the herbarium towards imminent completion of studies in the Phyllanthaceae with Ian Telford, and finalisation of a review of taxonomy of *Carpha* and *Asterochaete* (Cyperaceae, Schoeneae) with Xiufu Zhang and Karen Wilson.

It has been very stimulating, working in an environment where one can have conversations with Mark Chase, Paul Rudall, Petra Hoffman, Carol Furness, Felix Forest, Steve Hopper and many other botanists. Certainly, it has been great being able to discuss Cyperaceae with Kew's Cyperaceae specialist Dave Simpson. As timing would have it, November saw the publication of

Fig. 6. In the molecular lab.
Ph. Laszlo Csiba, Jodrell Laboratory.



his group of similarly learned and quick-witted legume colleagues.

On the home front

Fran and the boys have long since settled in to life in Richmond. The boys are enjoying school at Darell Primary, and the school seems to be happy with them. It is a great local school.

Your requests

Please do send ABLO related requests to ABLO@kew.org. Please include "ABLO: ..." in the subject line. Please set out clearly what you want and the relevant background information that will help me locate the specimen/literature.

Please check out the resources at K, including "Botanical information from Kew and beyond" (Web ref. 7) with clear links to the Herbarium catalogue (not well populated) and the K Library catalogue (very useful and gives you the location in the Library of the item),

The BM has a good on-line link for access to the book library catalogue, their digital library and more (Web ref. 8)

Of course, see the information ABRS, ABLO guide for requests and visits (Web refs. 9,10).

Another website worth looking at is that of The Linnean Society of London (Web ref. 11). Go to the 'Collections' and select the button on the left hand side 'Linnean Society Collections Online'. Along with other great resources, you can select the 'The Linnaean Herbarium' and get images of specimens in LINN. The images rescale at higher magnification to maintain clarity and there is a useful measuring tool. Any requests for ABLO to visit LINN should follow examination of the web site and include a LINN catalogue number that is available for each specimen from that web site.

Upcoming and further information

I hope to spend most of the time leading up to Christmas, at K in the Jodrell and in the Herbarium dealing with requests and undertaking my research. There is a talk entitled 'The Great Linnean Enterprise: Then and Now' by Edward O. Wilson FMLS at the Linnean Society of London on Wednesday 12th December 2007 that I hope to go to, along with a visit to LINN. From the 27 Dec – 7 Jan I will travel to northern Scotland to visit friends with the family. Early in the New Year I hope to visit CGE, and P. Thereafter, GENT, L, FI, NMW. To keep you informed and give you the best chance of organising requests in time for any of these visits, I will email the Council of Heads of Australasian Herbaria (CHAH's list server) at least a week ahead of such visits. If I get a chance, I will also establish a blog site that will alert you of my intentions regarding herbarium visits.

Finally, if you are planning a visit, please let me know well in advance so I can best facilitate your visit. If you are coming directly to K from Heathrow, I would follow Anne Morley-Smith's great advice and take the Piccadilly Line underground train from Heathrow to South Ealing, walk up the stairs, cross the road, walk 10 m to the right and catch the 65 bus (very regular service) and get off at Kew Bridge or Kew Road stops and walk over to the Herbarium. See Web refs 12–14.

References

- Govaerts R, Simpson DA, along with Bruhl JJ, Egorova T (sadly, deceased), Goetghebeur P, Wilson K (2007) 'World checklist of Cyperaceae. Sedges.' 765 pp. (Royal Botanic Gardens: Kew) ISBN 978-1-84246-199-0.
- Web ref. 1. www.kew.org
Web ref. 2. www.kew.org/henry-moore
Web ref. 3. <http://sweetgum.nybg.org/ih/>
Web ref. 4. <http://maps.google.com.au/>
Web ref. 5. www.kew.org/wcsp/home.do

Web ref. 6. http://en.wikipedia.org/wiki/Bernard_Verdcourt

Web ref. 7. <http://www.kew.org/data/index.html>

Web ref. 8. www.nhm.ac.uk/research-curation/library/botany-library/index.html

Web ref. 9. www.environment.gov.au/biodiversity/abrs/admin/ablo/requests.html

Web ref. 10. www.environment.gov.au/biodiversity/abrs/admin/ablo/visits.html

Web ref. 11. <http://linnean.org/>

Web ref. 12. www.tfl.gov.uk/home.aspx

Web ref. 13. <http://maps.google.com.au/>

Web ref. 14. www.kew.org/visitor/findkew.html

Jeremy Bruhl

Australian Botanical Liaison Officer (ABLO)

September 2007 – August 2008

Book reviews

Comments on Sturt Pea book

Alex George

'Four Gables', 18 Barclay Road, Kardinya, W.A. 6163

***Sturt pea: a most splendid plant.* By David Symon & Manfred Jusaitis, Board of the Botanic Gardens and State Herbarium and Department for Environment and Heritage, Adelaide (2007).**

[See also V. Hankel, *Austral. Syst. Bot. Soc. Nsltr* 131–132 (2007) 25–27.]

Like its subtitle, this is a splendid book, a visual feast. The authors have ranged widely to describe the plant, its biology, horticulture and use in art, craft, design and literature. However, I would like to comment on several points.

The collection by William Dampier is said by the authors to be from Shark Bay and is so mapped on p. 20 (but omitted from the map on p. 37). Dampier himself and all subsequent writers (until now) have placed the island on which he collected it in what we know as the Dampier Archipelago, possibly East Lewis Island. The authors have given no reason for their interpretation and it seems likely to be an error, unfortunate because it may be perpetuated by later writers using this book as their source. The currently known natural occurrence of Sturt Pea does not include the Shark Bay area.

The authors commented (p. 16) on Sturt Pea as "not ... necessarily having 'thick broad leaves'" as described by Dampier in his account published in 1703. As I have written in publication (George 1999) he confused two species and his description of the leaves refers probably to either *Canavalia rosea* or *Ipomoea pes-caprae*, both of which are common on the north-west coast but are unrecorded south of North-West Cape. After

my book was published I visited East Lewis Island and photographed plants of Sturt Pea and *Canavalia* growing intermingled near the beach.

To the portraits of those involved in the discovery of Sturt Pea may be added one of Frederick Bedwell (collector of the type of the name *Donia formosa*)—see Horden (1997, p. 27). Note that this Phillip King has double 'll' in his name. The locality 'Curlew River' where Bedwell found the plant is considered to be a small tidal creek near the mouth of the Ashburton River, not the Ashburton itself (Curry 2002, p. 13).

The modern name for 'Regent's Lake', the locality where the type of *Donia speciosa* was collected, is Lake Cargellico, not the Lachlan River.

On p. 95, the second plant in Ellis Rowan's painting is not a *Bossiaea* but *Leptosema aphyllum*.

The use of 'flag' for the upper petal is unusual. Shorter than the commonly used 'standard', rarer 'vexillum' and even rarer 'banner', I have found, albeit in a small sample of the literature, no other work that uses it.

References

Curry S. *et al.* (2002). *Allan Cunningham's Australian Collecting Localities*. Australian Biological Resources Study, Canberra.

George A.S. (1999). *William Dampier in New Holland ...* Blooming Books, Hawthorn.

Horden M. (1997). *King of the Australian Coast: The Work of Phillip Parker King in the Mermaid and Bathurst 1817–1822*. Melbourne University Press ..., Carlton South.

New books

Field guide to eastern Australian rainforest climbers

***Rainforest climbing plants: a field guide to their identification.* By Gwen Harden, Bill McDonald and John Williams. Published by Gwen Harden Publishing, A4 size, 192 pages, paperback. A\$35 (RRP \$40)**

The book covers: descriptions of 265 species, all illustrated, from Rockhampton to Victoria, all major rainforest types including Vine Thickets, and includes keys to groups and all species.

See flyer included with this issue of the Newsletter.

An encyclopaedia on Linnaean apostles

The Linnaeus Apostles: Global Science & Adventure.

ISBN: 978-1-904145-26-4 (for complete set of eight volumes, eleven books).

Standard edition: £580.00 + shipping;
limited edition: £780.00 (free shipping)

These volumes have already been mentioned in relation to the article by Professor Sörlin in this issue. For much more information and to subscribe to this impressive enterprise see their website from which the quote below is taken.

The publication of a major international series of eight volumes—in all 11 books and approximately 5,000 pages—has been in preparation since the beginning of this century under the overall title of *The Linnaeus Apostles - Global Science & Adventure*. All the accounts of the apostles' journeys to every continent will be published here for the first time in English; those of the apostles who left no travel journals are described through their correspondence or other sources. In the introductory and concluding volumes world experts in various subject fields will provide accounts of the 18th century, of Linnaeus, of travelling and the hardships of field work, together with biographies and a comprehensive new bibliography of the publications of the apostles.

It is not clear just which of the volumes have already been printed, but from information on the website "seven volumes are planned for publication and distribution during the first quarter of 2008. The first volumes to be ready will be the apostles' own texts in volumes two to seven, followed by volume one (Introduction). Volume eight (Encyclopædia), which includes biographies, maps, a completely new bibliography as well as the entire search register for all the volumes, may be somewhat further delayed and not printed until later in the year 2008."

Website: www.ikfoundation.org/shop/linnaeus-gsa.html

The first volume of a Flora of Korea

Flora of Korea 1. Genera of Vascular Plants of Korea. Editor-in-Chief: Chong-wook

Park. In English, 1498 pp., hard cover, large format 188 x 258 mm, 3.5 kg.

Published October, 2007.

ISBN 978-89-7616-380-6 94480. List price:
US \$195.00.

The *Genera of Vascular Plants of Korea* is essentially an introduction to the *Flora of Korea*, which will be a series of eight volumes, in 10 parts, published in English over the next several years. The aim of the *Genera* is to provide a synopsis of the vascular plants occurring on the Korean peninsula and a framework upon which the volumes of the *Flora* will be based. The *Genera* includes the accepted scientific name, citations of relevant literature, the Korean name, descriptions of families and genera, identification keys, distribution information, illustrations of the genera endemic to Korea and comments on taxonomic problems. For each species, the basionym, place of publication, phenological information, a summary of geographical range, worldwide and within Korea, and habitat are also provided. The *Genera* contains treatments of 217 families, 1045 genera, 3034 species, and 406 infraspecific taxa. Taxa treated include indigenous species, introduced ones that are well established, and a few cultivated plants frequently found outside of cultivation (see Web site).

For further information about the volumes and projected dates of publication see the website.

Web site: <http://flora.academybook.co.kr/>

Robyn Barker

Meeting reports

'Up there Cazaly' – the ASBS National Conference, Darwin 2007

Gillian Towler

National Herbarium of NSW

Bill Barker

State Herbarium of South Australia

The two-day ASBS Annual Symposium, *Australian Plant Taxonomy*, held in Darwin (Palmerston) on 24 and 25 September, 2007 was well attended by about 60 delegates.

The venue for the Symposium was the highly awarded Cazalys Palmerston Club (voted '2007 Best NT Keno Venue' and '2007 Best Club Community Service' at this year's AHA NT Awards for Excellence) which was located only

a hop, skip and a jump away from the Darwin Herbarium.

Following registration and John Clarkson's welcoming address, the day opened with a taxonomy and systematics flavour with John Conran (University of Adelaide) presenting two papers, one a review of the *Drosera whittakeri* complex including a description of a new species from Kangaroo Island, and the other recognising a new species of *Romnaldia* (Asparagales:

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Fig. (Clockwise from top left). a, left clockwise Wayne Gebert, waitress, Annette Wilson, John Conran, ... Murray Henwood, Darren Crayn, Zoe Smith.; b, c, Bort Edwards and Ian Cowie presenting their posters; d, an attentive audience including (from left) Darren Crayn, Trevor Wilson, back row Bort Edwards, Mike Crisp, Garry and Nada Sankowsky. Photos: Bryan Simon.

Laxmanniaceae) from the Daintree World Heritage region. Also presenting in this session were Zöe Smith (RBG Melbourne) with an interesting study assessing which characters are useful in determining species boundaries in the morphological classification of Victorian *Diuris* species, and Gay McKinnon (UTAS) with her fine-scale study investigating the pattern and extent of nuclear DNA introgression in a mixed eucalypt population in the Meehan Ranges.

After an extended morning tea break due to power failure (apparently a very common occurrence in the Territory – power failure, that is, not extended morning teas!), we were off again, this time following a phylogeny and biogeography theme. Darren Crayn (NSW) commenced with a presentation highlighting the need to identify and address key gaps in our phylogenetic knowledge of the Australian tropical flora and suggested a way forward with this work through a co-ordinated and targeted approach. We then heard from Richard Carter (ANU) about his study of the genus *Brachychiton* and closely related taxa and what they can tell us about the origins and evolutionary history of the Australian monsoonal flora. Mike Bayly (University of Melbourne) then

took to the floor with a presentation investigating variation in the alpine genus *Chionohebe* to test hypotheses about origins of two Trans-Tasman species, assess phylogeographic patterns within New Zealand and aid revision of species and genus-level taxonomy.

After lunch we continued where we'd left off. The first speaker, Trevor Wilson (University of Sydney) gave an overview of his work exploring the evolution of pollination mechanisms in *Prostanthera*, highlighting the application of microcomputed tomography (Micro-CT) as a non-destructive sampling technique to investigate the positional relationships of floral organs. Following was Mike Crisp (ANU) presenting his study of the endemic radiation of the egg and beacon peas (Fabaceae: Mirbelieae and Bossieae), Don Franklin (Charles Darwin University) with a look at the biogeographic implications of re-interpretation of the taxonomy of Australian native bamboos, Gill Brown (University of Melbourne) with phylogenetic insights into the bipinnate acacias of Australia, and Tanya Scharaschkin (Queensland University of Technology) ending the session with her presentation on the implications of character

evolution in determining ancestral states and homologies, using *Anaxagorea* as an example.

Matt Flower (GHD Darwin), later awarded the ASBS 2007 Student Presentation Prize, began the late afternoon session, which shifted to the theme of Ethnobotany. He gave a very insightful talk on the plant taxonomy of the Wanyjirra People of the Ord-Victoria Plains region. Beth Gott (Monash University) brought us to south-eastern Australia, which by contrast had been subjected to years of study. She discussed indigenous plant use in the region, with particular reference to the Murnong or Yam Daisy (*Microseris lanceolata*), a widespread and abundant staple food of Aboriginal people throughout Victoria until the mid 19th century when introduced grazing animals virtually wiped it out.

After a day packed full of interesting and diverse presentations it was then time for the ASBS Annual General Meeting.

The second day kicked off with a session on the poster papers. The session had its own slot in the conference schedule, with authors having several minutes to summarise their paper before the standing throng. An added challenge, however, particularly for the quietly spoken, was the unpredictable, deafening gale that emanated from the air conditioning every 10 minutes or so. Presenters were: Gary Sankowsky of north Queensland on taking botanical photographs; Ian Cowie (DNA) on a flora survey of East Timor; Daren Crayn (NSW) on progress with barcoding in a New South Wales pilot project; Bort Edwards (University of Queensland) on molecular evidence for the non-monophyly of *Melaleuca*; Louis Elliot (Biodiversity Conservation Division – NRETA) on seasonal aspects of the cryptic rainforest saprophyte *Burmannia* sp. *Bathurst Island*; Belinda Pellow on the *eFlora of the Sydney Region*; Ilse Breitwieser (CHR) on trans-Tasman dispersal in *Craspedia*; Wayne Gebert (MEL) on geographic and subspecific variation in *Crowea exalata*; and Judy West (CANB) on the National Taxonomy Research Hub.

After the poster session we launched into a Conservation theme with presentations from John Clarkson (Queensland Parks and Wildlife)

on the spread of a dozen high biomass grasses in northern Australia; Bill Barker (AD) on the contrasting distribution, host range and threats of Australia's three *Orobanche* species; and Ian Cowie (DNA) on the adequacy of current survey knowledge of the Northern Territory flora for assessing conservation status.

Botanical Collections and Data Sets was the theme of the remaining two sessions. We heard from Bryan Simon (BRI) on progress with *GrassWorld*, a collaborative electronic global flora of grasses; Robyn Barker (AD) on pre-20th Century global dispersal of early Australian herbarium specimens illustrated particularly by the fate of James Drummond's Western Australian collections; Brendan Lepschi (CANB) on progress with the Australian Plant Census; Judy West (CANB) on a study of spatial biodiversity patterns in the Murray-Darling Basin and the extent and quality of the data integrated from surveys and herbarium collections provided by different state agencies; and Donna Lewis (Land and Vegetation – NRETA) on the successful development of the Northern Territory's vegetation classification system in compliance with a national standard, the National Vegetation Information System – an equivalent of an Australian Plant Census for vegetation.

The conference wound up with a progress report by Judy West on preparations for the 2011 International Botanical Congress and the official handover by Dale Dixon to Bill Barker representing the organising committee of the 2008 ASBS conference in Adelaide at the end of September.

John Clarkson, on behalf of ASBS Council and the participants, thanked the Organising Committee (Dale Dixon, Andrea Hope, Ben Stuckey, Ian Cowie, Raelee Kerrigan, Philip Short and Charmaine Tynan) and other DNA staff for all their hard work and support.

The untiring organising committee of this year's symposium did the sponsors, DNA, ASBS, CHAH and ABRS, proud, not easy as it followed on from hosting CHAH and HISCOM the previous week. The quality of the conference, the field trip and the workshops was exemplary.

Bryophyte Workshop – Darwin, 27–28th September 2007

Ben Stuckey
NT Herbarium

It was only a small class of 5 that gathered in the chilly identification room of the Northern Territory Herbarium for the Bryophyte Workshop to be run by David Meagher from MEL. Attendees were Nada Sankowsky, Ben Stuckey, Mike Bayley, Kath Ryan and Kathy Downs. We began

with a 'powerpoint' introduction to some of the smallest members of the plant world, looking at characteristic differences between Hornworts (Anthoceroophyta), Liverworts (Marchantiophyta) and Mosses (Bryophyta), as well as life cycles, growth habits and their general ecology. It was

interesting to note the presence of introduced 'weedy' mosses in S.E. Australia, the effects of which are poorly understood and also the importance of Bryophytes in colonising disturbed habitats. There are also a huge range of habitats that bryophytes occupy, with a wide range of adaptations to suit extremes in temperature and water availability. David helpfully pointed out that 'Irish Moss' and 'Stirling Moss' were not real mosses. Mike seemed a little disappointed that there wasn't a picture of 'Kate Moss' to validate her exclusion from the division.

Collection techniques and the preservation of Bryophytes were also discussed, at which point origami found its way into the program. David demonstrated the making of useful collecting 'pouches' from newspaper which I believe could also be quite useful for other small collections of plant material. Many collections may consist of entangled species from different phyla, so we began our taxonomic forays separating mosses from liverworts, something that can be a little confusing to the uninitiated. Satisfied that we could separate liverworts from mosses we

began working our way through various keys to identify moss genera and occasional samples to species level. The experience of having important and distinguishing features pointed out was invaluable. Toward the end of the course we were more thoroughly introduced to liverworts, the identification of which is somewhat more specialised than the mosses. Arrangement of leaves on the stem can be a crucial part of leafy liverwort identification and also gives rise to frightening terms such 'incubous' and 'succubous'.

The course was very worthwhile and a solid base for getting to know the important taxonomic differences in these often overlooked groups a lot better. Thanks to an editorial/scientific background and as a bonus for us, David was very willing to share some fascinating etymological facts and 'short stories' on just about any species name brought up in discussion. I am sure everyone enjoyed the two days and on behalf of the attendees I would like to thank ASBS and David for supporting and organising an excellent and rewarding short course.

Botanical Latin workshop, Darwin, 27–28th September 2007

Gill Brown

School of Botany, University of Melbourne

Nineteen people from all over Australia attended the Botanical Latin workshop run by Emma Short as part of the ASBS conference in Darwin. It was a stimulating and challenging course, which taught us the basics of Botanical Latin.

We started by learning our declensions (noun groups and their various case endings), with Emma writing table after table up on the whiteboard and us furiously scribbling them down into our notebooks. I was hoping it would become clear why one word needed to have all these different endings but for the time being I was content to let the *-em*'s, *-ibus*'es, and *-ui*'s of numerous Latin nouns float through my brain, hoping at least some of them would stick. The first coffee break of the day was eagerly welcomed by all and the confused conversations around the room indicated our eagerness was because our brains were about to explode rather than our late night return from the fieldtrip the previous day. With the caffeine kicking in, we finished off our declensions and moved onto declining adjectives with their nouns. Slowly but surely the penny was starting to drop with some answers even starting to come from the class.

The rest of the day moved along at a cracking pace and by the end we had covered nouns, comparative and superlative adjectives, *quam*,

participles and adverbs. Hopefully I wasn't the only person scratching my head and mumbling "what?!", as I struggled to recall if I ever learnt "superlative adverbs" and "participles" in English! Thankfully though, Emma had thought of this and these were also included in our workbook. So after an intensive day in the classroom, armed with a copy of Stearn's Botanical Latin¹ and our workbook, we were slowly beginning to master the art of Botanical Latin.

It was straight back into it on Friday morning this time learning numbers, prepositions, conjunctions, pronouns and verbs. Our confidence was slowly beginning to grow, and this was obvious as more correct answers were called out by the class. We were even starting to remember the gender and number of some common nouns (e.g. leaf, hair and stamen) and could sometimes decline them into the correct case before Emma put the answer on the board!

The final part of the workshop forced us to use everything we had learnt over the previous two days, as we translated a species description into Latin and wrote a diagnosis for two species of *Crowea*. Before we could get into our translation though, we first had to describe a mystery plant

¹ Stearn, W.T. (1983) *Botanical Latin*. (David and Charles: Newton Abbott)

in English. Some may say a few of us got a little carried away at this point, with a few characteristics proving difficult to translate; the most difficult being, "calyx inflated, half the length of the corolla". We resisted the temptation to modify our organism's phenotype, and instead reworded the tricky phrase for an easier translation (corolla in length is twice as long as the inflated calyx = *corolla in longitudine duplo longior quam calyx inflates*). I doubt our mystery plant, with features such as, "*flores atropurpurei maculis sex vel septum flavis vel albis. ovaria tria semiinferiora stylis glutinosis trifidis contractis*", will ever be found in the field. However, if you do find a plant matching our description we would be happy for you to use our Latin, as long as you don't mind 19 additional co-authors ☺

I'm sure the rest of the class would agree that Emma was an excellent teacher who brought so much enthusiasm and patience to the classroom, constantly answering our repetitive questions and putting up with our chorus of "but that's not what it says in the workbook!". While I don't think any of us will be reading "*Harrius Potter Et Philosophi Lapis*"² soon, thanks to Emma we are now armed with the skills to translate botanical

descriptions and write accurate diagnoses. I only hope that when something we've written in Latin happens to pass over Emma's desk for checking it won't cause her to cringe too much.



Fig. Emma Short at Botanical Latin workshop. Above, assisting Gill Brown (right); Left, being thanked by Andrew Mitchell on behalf of group.

Photos: Anna Monro



² *Harrius Potter et Philosophi Lapis* by J.K. Rowling (P. Needham, tr.); for a grammatical commentary and notes on the book's translation into Latin from Ass. Prof. John Porter's 2nd year Latin course at the University of Saskatchewan (see <http://homepage.usask.ca/~jrp638/latin/potter.pdf>)

'Down the track' – the 2007 ASBS Symposium field trip John Clarkson

After two days of sitting in air conditioned comfort, 38 conference delegates set off "down the track" to experience some of Australia's real tropics. At least I think there were 38. I didn't count how many got on the bus and we found out as we drove away from the first stop that neither had our guide Dale Dixon. The first break was a quick comfort stop at Adelaide River home of Charlie the buffalo who starred in the movie *Crocodile Dundee*. Charlie is now stuffed and stands on the bar at the Adelaide River Inn. A few hours later many of the participants were to feel much like Charlie or at least wished they could swap places with him. The maximum forecast temperature for Katherine that day was 36°C, about normal for that time of the year. Met Bureau records show that it actually got to 37.5°.

The first botanical stop was just north of Emerald Springs to examine a population of the vulnerable wattle *Acacia praetermissa*. This species is known from only two small populations in a very restricted area quite close to the Stuart Highway. While the population of adult plants seems to be stable, no seedling recruitment has been observed

during recent visits. A definitive explanation for this remains unknown. Will it lead to a population decline over time and what might be the consequences of any future widening or realignment of the Stuart Highway?

Back on the bus and off to a spot just north of the Ferguson River to see *Grevillea benthamiana*. The late dry season is not a particularly good time to see flowering specimens in tropical savanna woodlands but there was enough in flower to keep most people interested and their minds off the heat.

As people wandered around under the hot tropical sun I wondered if the size of the hats being worn was in any way related to how far south the wearer came from. It seemed to me that there might well have been a strong inverse correlation between the brim size and latitude at least for the males. The Territorians and North Queenslanders all wore hats with brims wide enough to shelter the whole family whereas the southerners had hats which were more like fashion accessories. Marco Duretto in particular sported a very natty

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number in blue and grey checks which perfectly matched his blue and grey striped shirt. He claims that he left his hat at home and this was the best he could find in Darwin at short notice.

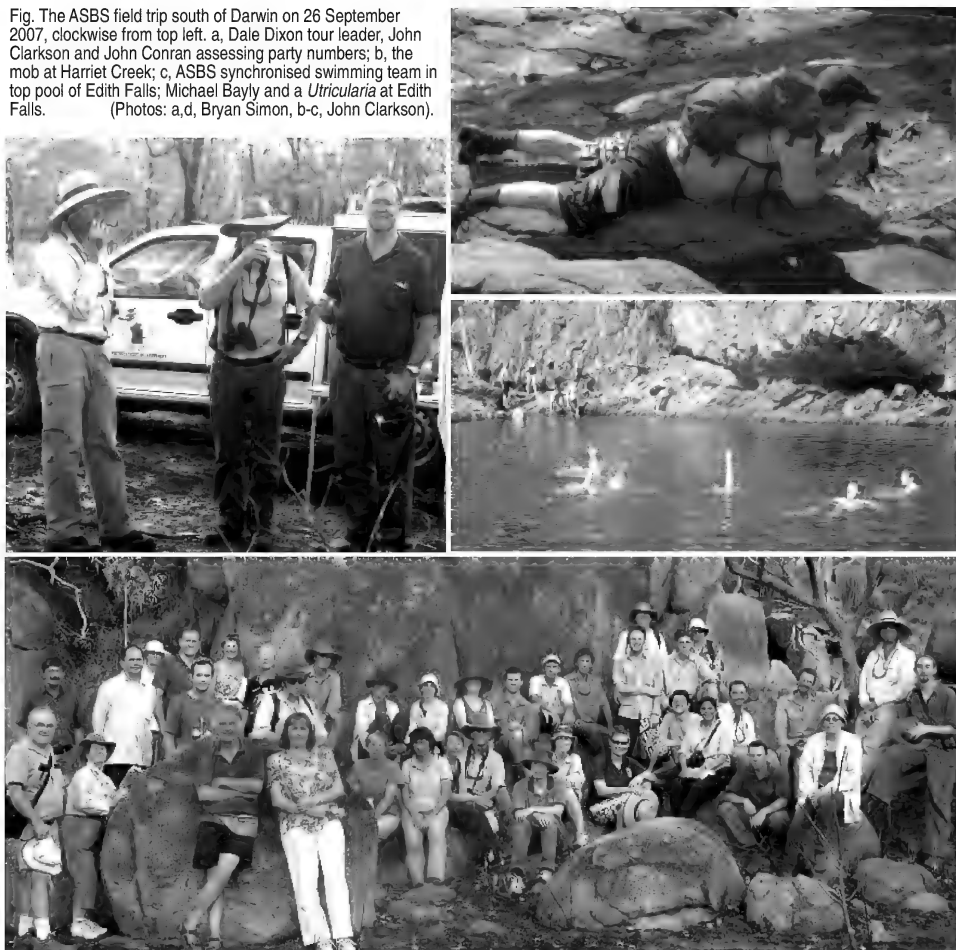
Probably the highlight of the trip was the lunch time stop at Leliyn (Edith Falls) and not just because of the delicious lunch on the shady lawns of the day use area. Leliyn, part of the Nitmiluk National Park, is located about 60 km by road north of Katherine. Given the choice of sitting in the shade by the pool below the falls or walking the 2.6 km Leliyn track which climbs to the top of the escarpment then down to the upper pool above the falls, it was surprising how many participants opted for the walk. Botanists wherever they are based are certainly not wimps. But then again perhaps it was the lure of a swim in the top pool that lured many of the walkers.

While some kept their minds firmly on the plants, the ASBS synchronised swimming team put on an impromptu performance. Considerable training will be required if they are to make it to Beijing.

Leliyn was such an idyllic spot that we were running well behind schedule when we left. With more than 300 km to drive back to Darwin, and one more stop to see on the way, it was obvious that we were not going to be back in Darwin until well after dark. Luckily we had a very accommodating bus driver.

The final stop for the day took us to a rock outcrop near Harriet Creek along the Kakadu Highway from Pine Creek. The feature plant here was to be *Cycas conferta* but growing amongst the rocks was a very odd plant of the common climbing legume *Abrus precatorius*. The seeds of *Abrus* are usually red and black but the seeds

Fig. The ASBS field trip south of Darwin on 26 September 2007, clockwise from top left. a, Dale Dixon tour leader, John Clarkson and John Conran assessing party numbers; b, the mob at Harriet Creek; c, ASBS synchronised swimming team in top pool of Edith Falls; Michael Bayly and a *Utricularia* at Edith Falls. (Photos: a,d, Bryan Simon, b-c, John Clarkson).



produced on one branch of this particular plant were wholly black. This moved John Conran to pen the following verse.

The Black Abrus (ABRS?)
(sung to the 'Black Adder' theme)
by John Conran, University of Adelaide

It's twining through the undergrowth,
A legume poisonous and clever,
Its seeds are blacker than a coal,
Attached to fruits with walls like leather,

Black *Abrus*!
Black *Abrus*!
The plant with pitch-black seed,
Black *Abrus*!
Black *Abrus*!
It's poisonous indeed.

Discovered by ASBS,
While on a field trip to the nether
Regions south of Darwin town,
On rock piles burnt, but still with cover,

Black *Abrus*!
Black *Abrus*!

With many a climbing stem,
Black *Abrus*!
Black *Abrus*!
You toxic little gem!

For those of you who don't know what Black Adder was have a look on the web (Web ref. 1) and, if you can't recall the theme from the series it, like nearly everything these days, can be found there too (Web ref. 2). John's words certainly fit well with the tune. There is a hidden talent of some sort there. Had John penned his lyrics a little quicker we could have had a sing along on the way home to Darwin.

Thanks to Dale and his helpers Ben Stuckey and John Westaway for a marvellous trip.

Web ref. 1. www.bbc.co.uk/comedy/blackadder/

Web ref. 2. www.geocities.com/blackadderhomepage/themetunes.html

Coming meetings

2008

Systematics 2008

German Society for Biological Systematics and the German Botanical Society.
Conference language is English.
7–11 April 2008, University of Göttingen, Göttingen, Germany.

Web site. www.systematics2008.com/

16th Australian Weeds Conference

Weed Management 2008 – Hot Topics in the Tropics

18–22 May 2008, Cairns Convention Centre, Queensland; Early Bird registration now open.

Web site. www.wsq.org.au

18th World Bromeliad Conference

Bromeliads Down Under

24–29 June 2008, Cairns International Hotel, Cairns

Web site. www.bromeliadsdownunder.com/

Botany 2008

The Joint Annual Meeting of Canadian Botanical Association/L'Association Botanique du Canada, American Fern Society, American Society of Plant Taxonomists, Botanical Society of America

26–30 July 2008, University of British Columbia, Vancouver, Canada

Web site. www.2008.botanyconference.org/

Monocots IV

The Fourth International Conference on The Comparative Biology of the Monocotyledons

& The Fifth International Symposium on Grass Systematics and Evolution

11–15 August 2008, Copenhagen, Denmark

Web site. www.monocots4.org/

Coast to Coast

17–21 August 2008, Darwin Convention Centre, Darwin, Northern Territory

Web site. www.coast2coast.org.au/

19th International Symposium of Subterranean Biology,

22–26 September 2008, Fremantle, Western Australia

Web site. www.issb2008.org.au

ASBS

28 September – 3 October 2008, University of Adelaide, Adelaide, South Australia

Web site. www.anbg.gov.au/asbs/conferences/index.html

2009

8th International Temperate Reefs Symposium

12–16 January, 2009.

University of Adelaide, Adelaide.

Web site. www.marinebiology.adelaide.edu.au/conference/

International Forest Biosecurity Conference, incorporating the 6th International Forest Vegetation Management Conference

16–20 March 2009

Rotorua, New Zealand,

Contact Dr Anna Hopkins: Anna.Hopkins@ensisjv.com

Web site. www.ensisjv.com/NewsEventsandPublications/EventsandSponsorship/tabid/147/Default.aspx?PageContentID=421

10th INTECOL Congress

Ecological Society of Australia and New Zealand Ecological Society partners hosting the 10th International Congress of Ecology

16–21 August 2009, Brisbane, Queensland

Web site. www.intecol10.org

2011

XVIII International Botanical Congress July 17 - 23, 2011; Melbourne, Australia

We can expect much information on the IBC as this date draws closer.

From Enviroweeds

The EnviroWeeds discussion group's list address can be accessed through www.weeds.crc.org.au/main/enviroweeds.html

Gamba Grass now a declared plant for Western Australia

Gamba grass (*Andropogon gayanus*) has been added to the declared plant list for Western Australia, meaning it can no longer be brought into or sold in that State, and all known plants must be eradicated. The announcement is effective as of 21 December 2007 under the *Agriculture and Related Resources Protection Act 1976*.

Date Palm: salinity fighter and/or environmental nuisance

Publicity given on ABC TV's Landline programme to the proposed use of the drought and salinity tolerant date palm (*Phoenix dactylifera*) by farmers along the River Murray raised inevitable concerns about its ability to become an environmental problem as in the Millstream Chichester national park in the Pilbara region of Western Australia.

Promoting weed awareness in Aboriginal communities of Northern Australia.

To promote weed awareness in Aboriginal communities of northern Australia a *Weed and plant collecting manual* has been produced by the Australian Quarantine & Inspection Service, the Indigenous Land Corporation and the Weeds CRC (Web ref. 1, 2).

The manual is designed as a resource for indigenous ranger groups and communities contracted by AQIS to collect plant and weed samples and will supplement the surveys of remote areas of the northern Australian coastline conducted by scientists of the Northern Australia Quarantine Strategy (NAQS).

Web ref. 1. www.weeds.crc.org.au/publications/education_training_resources.html

Web ref. 2. www.weeds.crc.org.au/projects/project_4_1_4.html

Rod Randall's list of weeds available electronically

Every introduced plant species in Australia is listed in the newly released *The introduced flora of Australia and its weed status*, with information on its weedy status here and worldwide. A total of 29,430 plant species are listed, including 606 Australian ones that have naturalised outside their native range. This publication is available on-line (Web ref.).

A searchable database giving access to the information in the publication can also be found on the site.

Web ref. www.weeds.crc.org.au/publications/index.html

Cars and seed dispersal

Studies in Germany have shown that cars are responsible for a significant amount of seed dispersal along motorways.

Web ref. www.newscientist.com/article/dn12417:jsessionid=KDAMIJBBNII

Fighting weeds with model helicopters

This one wasn't from Enviroweeds but can be found in the December issue of *Contours* magazine of the Department of Agriculture, Fisheries and Forestry (Web ref.).

Attacking weed infestations in environments that are easily accessible is fairly straightforward. But dealing with infestations in remote and inaccessible areas has long been a problem. Associate Professor Salah Sukkarieh and his team at the Australian Centre for Field Robotics (ACFR) at the University of Sydney may have some answers in the use of Hovering Unmanned Aerial Vehicles (HUA Vs) or robotic helicopters to deliver the herbicide following surveys by fixed wing aircraft.

Web ref. www.daff.gov.au/_data/assets/pdf_file/0011/494183/contours-dec-07.pdf

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From outside Australia: add the country code 61 and omit the leading zero of the area code

AD tel: (08) 8222 9307 fax: (08) 8222 9353 www.flora.sa.gov.au	HO tel: (03) 6226 2635 fax: (03) 6226 7865 www.tmag.tas.gov.au/Herbarium/ Herbarium2.htm	MEL tel: (03) 9252 2300 fax: (03) 9252 2350 www.rbg.vic.gov.au/ biodiversity/	NSW tel: (02) 9231 8111 fax: (02) 9251 7231 www.rbg.vic.gov.au/conervation _research/herbarium_&_services
CANB tel: (02) 6246 5108 fax: (02) 6246 5249 www.anbg.gov.au/	BRI tel: (07) 3896 9321 fax: (07) 3896 9624 www.epa.qld.gov.au/nature_ conservation/plants/ queensland_herbarium	DNA tel: (08) 8999 4516 fax: (08) 8999 4527 www.nt.gov.au/pwcnt	PERTH tel: (08) 9334 0500 fax: (08) 9334 0515 http://science.calm.wa.gov.au/ herbarium/
QRS tel: (07) 4091 8800 fax: (07) 4091 8888	MBA tel: (07) 4048 4745/4743 fax: (07) 4092 3593	NT tel: (08) 8951 8791 fax: (08) 8951 8790	Australian University Herbaria Contact CHAH representative: Murray Henwood, University of Sydney
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These listings are published in each issue. Please inform the Editors of any change

ASBS Publications

History of Systematic Botany in Australia

Edited by P.S. Short. A4, case bound, 326pp. ASBS, 1990. \$10; plus \$10 p. & p.

For all those people interested in the 1988 ASBS symposium in Melbourne, here are the proceedings. It is a very nicely presented volume, containing 36 papers on: the botanical exploration of our region; the role of horticulturists, collectors and artists in the early documentation of the flora; the renowned (Mueller, Cunningham), and those whose contribution is sometimes overlooked (Buchanan, Wilhelmi).

Systematic Status of Large Flowering Plant Genera

Austral.Syst.Bot.Soc.Nsltr 53, edited by Helen Hewson. 1987. \$5 + \$1.10 postage.

This Newsletter issue includes the reports from the February 1986 Boden Conference on the "Systematic Status of Large Flowering Plant Genera". The reports cover: the genus concept; the role of cladistics in generic delimitation; geographic range and the genus concepts; the value of chemical characters, pollination syndromes, and breeding systems as generic determinants; and generic concepts in the Asteraceae, Chenopodiaceae, Epacridaceae, *Cassia*, *Acacia*, and *Eucalyptus*.

Australian Systematic Botany Society Newsletter

Back issues of the Newsletter are available from from Number 27 (May 1981) onwards, excluding Numbers 29, 31, 60-62, 66, 84, 89, 90, 99, 100 and 103. Here is the chance to complete your set. Cover prices are \$3.50 (Numbers 27-59, excluding Number 53) and \$5.00 (Number 53, and 60 onwards). Postage \$1.10 per issue, apart from \$1.75 for the Large Genera issue (Number 53).

Evolution of the Flora and Fauna of Arid Australia

Edited by W.R. Barker & P.J.M. Greenslade. Peacock Publications, ASBS & ANZAAS, 1982.

\$20 + \$8.50 postage.

This collection of more than 40 papers will interest all people concerned with Australia's dry inland, or the evolutionary history of its flora and fauna. It is of value to those studying both arid lands and evolution in general. Six sections cover: ecological and historical background; ecological and reproductive adaptations in plants; vertebrate animals; invertebrate animals; individual plant groups; and concluding remarks.

Also available from. Peacock Publications, 38 Sydenham Road, Norwood, SA 5069, Australia. (To obtain this discounted price, post a photocopy of this page with remittance).

Ecology of the Southern Conifers (Now out of print)

Edited by Neal Enright and Robert Hill.

ASBS members: \$60 plus \$12 p&p non-members \$79.95.

Proceedings of a symposium at the ASBS conference in Hobart in 1993. Twenty-eight scholars from across the hemisphere examine the history and ecology of the southern conifers, and emphasise their importance in understanding the evolution and ecological dynamics of southern vegetation.

Postage rates: Those quoted apply only within Australia. Please e-mail for prices to other locations.

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AUSTRALIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

The Society

The *Australian Systematic Botany Society* is an incorporated association of over 300 people with professional or amateur interest in botany. The aim of the Society is to promote the study of plant systematics.

Membership

Membership is open to all those interested in plant systematics. Membership entitles the member to attend general meetings and chapter meetings, and to receive the *Newsletter*. Any person may apply for membership by filling in a "*Membership Application*" form, available on the Society website, and forwarding it, with the appropriate subscription, to the Treasurer. Subscriptions become due on January 1 each year.

The ASBS *annual membership subscription* is \$45(Aust.); full-time students \$25. Payment may be by credit card or by cheques made out to *Australian Systematic Botany Society Inc.*, and remitted to the Treasurer. All changes of address should be sent directly to the Treasurer as well.

The Newsletter

The *Newsletter* is sent quarterly to members and appears simultaneously on the ASBS Web site. It keeps members informed of Society events and news, and provides a vehicle for debate and discussion. In addition, original articles, notes and letters (not exceeding ten published pages in length) will be considered.

Citation: abbreviate as *Austral. Syst. Bot. Soc. Nsltr*

Contributions

Send to the Editors at the address given below. They *preferably* should be submitted as: (1) an MS-DOS file in the form of a text file (.txt extension), (2) an MS-Word.doc file, (3) a Rich-text-format or .rtf file in an email message or attachment or on an MS-DOS disk or CD-ROM. *Non-preferred* media such as handwritten or typescripts by letter or fax are acceptable, but may cause delay in publication in view of the extra workload involved.

Formatting of submitted copy. Please use Word in formatting indents, bullets, etc. in paragraphs and for tables. Do not format primitively with tabs, which change with the Normal style sheet. If embedding tables or references or other Objects from other software (Excel, bibliographic software, etc.) ensure that these are converted to Word tables or paragraphs. Letters in abbreviations of Australian States (SA, WA etc., but Vic.) and organisations (e.g. ASBS, ABRIS) should not be separated by full-stops, but initials should be (e.g. W.R. Smith, not WR Smith).

Images: their inclusion may depend on space being available. Improve scanned resolution if printing your image is pixellated at a width of at least 7 cm (up to a 15 cm full page). Contact the Editors for further clarification.

The *deadline* for contributions is the last day of February, May, August and November. All items incorporated in the *Newsletter* will be duly acknowledged. Any unsigned articles are attributable to the Editors.

Authors alone are responsible for the views expressed, and statements made by the authors do not necessarily represent the views of the *Australian Systematic Botany Society Inc.* Newsletter items should not be reproduced without the permission of the author of the material.

Advertising

Advertising space is available for products or services of interest to ASBS members. The current fee is \$100 per full page, \$50 per half-page or less.

Flyers may be approved for inclusion in the envelope for products or services of interest to ASBS members. The current fee is \$100 per flyer, plus the cost of inserting them (usually roughly \$25-30). Flyers are not part of the *Newsletter* and do not appear with the *Newsletter* on the ASBS Web site.

A 20% discount applies for second and subsequent entries of the same advertisement. Advertisements from ASBS members are usually exempt from fees but not the insertion costs in the case of a flier. Contact the Newsletter Editors for further information.

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